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W. H. DALRYMPLE, Editor. BATON ROUGE, LA.

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A CHANGE.

At the time of writing this article, or announcement, which is previous to the annual meeting of the Association, it is not possible to say who the next editor of THE JOURNAL may be, although a change is certain. When the present incumbent of the office was elected at the Philadelphia meeting last year, the war was still going on, and many of our ablest members were called to the service, including the previous editor, Dr. P. A. Fish, whose resignation was a decided loss to our publication. And while he considered it a very high compliment and honor to be chosen to succeed Dr. Fish, he consented to accept the position during the unsettled times occasioned by the war, but with the hope and expectation that in a year or so, or after hostilities had ceased, some other member would be elected to the office and be in a position to devote more of his time to the work of THE JOURNAL, which is very much needed.

With a full program of regular duties, besides numerous other calls upon his time, the present editor realized at the time, that in assuming the editorship of THE JOURNAL, which includes the business management, he was undertaking, with limited office help, a very responsible and more or less difficult task. How-

ever, notwithstanding the increased membership in the Association, and many irregularities brought about by war conditions, he has tried to get out a reasonably presentable publication, and desires to take this opportunity to thank all those who have in any way assisted him by contributing to its support in a literary way; and at the same time ask that any discrepancies and shortcomings on his part may be overlooked, or excused, under the circumstances.

Even at the present time the work of THE JOURNAL is more than one individual can properly attend to whose time is more or less fully occupied with other duties; and with the growth of the Association, this will become more and more evident. However, by the time this appears in print, some change may have been made which will meet the exigencies of the case. At the same time, whatever change may be made with regard to the management of THE JOURNAL, the writer has not the slightest doubt but that our official organ will go on increasing in prestige and usefulness to the profession as the years pass by.

For the new editor, whoever may be chosen, the writer bespeaks the same generous assistance and support from the membership as he has received during his incumbency of the office.

W. H. D.

ADULTERATED DRUGS AND "SUBSTITUTES."

In an article appearing in a recent number of *The Breeder's Gazette*, we find that warning has been sent out by a reputable drug firm that animals are being poisoned by "fake" turpentine containing pine oil, wood naphtha, or other poisonous adulterants, which impurities are likely to be found in "turpentine substitute" intended for painting purposes. *The Gazette* very naturally suggests that stockmen should not buy turpentine for medicinal purposes at a paint store, or from any one other than a dealer in pure drugs; and also, that any drug to be given to ailing animals should be appropriate for the sickness present, unadulterated and safe, and properly administered. For these reasons, unless absolutely impossible, it is always safe to have the drug prescribed and administered by a trained veterinarian. The article also refers to the use of linseed oil obtained from a similar source, viz., the paint store, and its frequent ill effects.

We do not think there can be any question that many animals

succumb to the paint store variety of linseed oil. Many farmers who use linseed oil, medicinally for their stock, purchase it at the country store, which keeps it solely to dispose of for mixing paints, which of course is the boiled variety; and not only so, but the "bung-boiled" oil at that, which, instead of being put through the process of ebullition, has chemical agents, such as litharge, or the monoxide of lead, introduced through the bung-hole to precipitate the gums to bring about, in a much shorter space of time, the drying effect which the boiling itself would have. The country store-keeper is hardly to blame, as he is asked for linseed-oil, and he gives his customer the only variety he keeps, viz., boiled oil, no doubt expecting that it is wanted to mix paints. But for a certificated druggist to dispense boiled oil on a prescription which calls for Ol. lini, is a much more serious matter, not alone as it may affect the patient prescribed for, but the injury it may do the professional name of the prescriber. A few years ago, the writer had just such an experience. He had prescribed linseed oil with the expectation of producing a slightly laxative action. No such result followed; the animal died, and on post-mortem, enteritis was quite apparent. Shortly afterwards, another horse belonging to the same owner was given a dose of Ol. lini on prescription from the same druggist, and with similar results. Still a third, and again the result was the same. Naturally there was consternation, in the case of both the owner and ourselves, as we were utterly at a loss to know, or even conjecture, the cause of all the trouble. Later a fourth horse, which the owner used for saddle purposes, and which was in perfect health, but as he was to be turned out to pasture for a time, the owner thought a mild dose of linseed oil would not do the animal any harm, and again had the same prescription filled by the same druggist. In a short while after the oil had been administered, the animal began to show signs of acute abdominal pain, which aroused the owner's suspicion as to the oil. He had the prescription again filled, but this time sent it to a chemical laboratory, with the result that lead was found in abundance by several of the recognized tests for lead. Here was the whole cause of our trouble. The druggist was dispensing "bung-boiled" oil on our prescription instead of the pure raw medicinal oil; and instead of getting the action we were desirous of securing, we were stopping up the emunctories, and literally "varnishing" the digestive tract. When the truth of the matter

was brought to light by the chemical analysis of the oil, of course we were exonerated, and the druggist had to "pay the piper."

Such a case goes to show how a practitioner's reputation may be absolutely ruined, although he may be entirely innocent, through the carelessness and ignorance of a druggist who does not know that boiled linseed oil belongs to the mechanic arts, and should be kept in that department, if he has one; and has nothing in the world to do with drugs which are to be given to animals for medicinal purposes. So that, while it is good advice to the stock-owner not to purchase his turpentine or his linseed oil for his animals from a paint store, it is also well for the veterinarian to remember that even the druggist, who is presumed to keep only pure drugs for medicinal use, may, through carelessness, or the lack of sufficient knowledge of the subject, sometimes lead him into serious trouble, and possibly ruin his reputation, while entirely innocent of any wrongdoing professionally.

OUR NEW EDITOR—DR. JOHN R. MOHLER.

With the publication of this number, the editorship and business management of THE JOURNAL passes into the hands of Dr. John R. Mohler, of Washington, D. C., and the Association is to be congratulated in being able to secure the services of such an able officer.

It seems entirely superfluous to try to expatiate upon the ability and capability of Dr. Mohler for this position, as he is so well and favorably known both nationally and internationally as Chief of the Bureau of Animal Industry of the United States Department of Agriculture, and as a former President of the American Veterinary Medical Association.

We feel, in fact we know, that Dr. Mohler's vast information and broad experience as an executive, a pathologist, and as an author, to say nothing of his splendid patriotism and his high ethical concept of matters professional, ensures the future greater success of our official organ.

However, as in the case of those who have preceded him, he will need the good will, patriotism and coöperation of the entire membership to aid him in his efforts toward advancement of the profession through the medium of the Association's mouthpiece—THE JOURNAL; and these we bespeak for him in an unstinted and generous manner.

As Dr. Mohler's new duties, as Editor, will commence with the January issue of THE JOURNAL, we take this early opportunity of stating that all official communications for the publication should, hereafter, be addressed to him at 1620 Hobart Street, Washington, D. C. W. H. D.

EDITOR'S NOTE: Owing to the change of Editor of THE JOURNAL, and the equipment having to be moved from Baton Rouge, La., to Washington, D. C., between the issuance of the December and January numbers, it is quite probable that the latter number may be a little late in getting out, as it will have to be printed and sent out from its new domicile under the direction of Dr. Jno. R. Mohler, Washington, D. C., the recently elected editor. We are not certain that any delay will be occasioned by the change; but in case it should, members and subscribers will know the reason for it, and we bespeak a little forbearance until Dr. Mohler gets the "machinery" of the publication in running order. We would also repeat, on account of the change mentioned, that all JOURNAL communications, whether from members, subscribers, or advertisers, should, hereafter, be addressed to Dr. John R. Mohler, Editor, Journal of the American Veterinary Medical Association, 1620 Hobart Street, Washington, D. C.

Prof. Russell L. Mundhenk, acting head of the Veterinary School of the Ohio State University, has resigned to accept a position with the Abbott Laboratories of Chicago.

Doctor Mundhenk is a graduate in pharmacy as well as in veterinary medicine, and has had a broad training and wide experience, particularly in biologic lines.

Serving as Captain of Infantry on the Mexican border on the outbreak of the war, he entered the United States Army as a line officer with the rank of captain. Later he was transferred to the Signal Corps, and attained the grade of lieutenant-colonel. He was awarded the Croix de Guerre by the French Government.

Dr. Mundhenk enters upon his new duties with the Abbott Laboratories with a most flattering recommendation from Dean D. S. White, of the Veterinary School of the Ohio State University.

THE ADDRESS OF THE PRESIDENT.*

VERANUS A. MOORE.

This annual gathering of the members of the veterinary profession of America gives an opportunity for considering the general matters pertaining to our organization and the problems that are before it for solution. It provides for the consideration of the demands that are being made constantly upon veterinarians to increase their efficiency in accord with changing knowledge and new conditions.

In presenting this address, I desire first to thank the Association for the honor conferred upon me by election to this office, and for the loyal support that has been given me. My gratitude is due especially to our able and efficient secretary and treasurer for their most valuable assistance. I wish also to thank the members of the committees, the officers of the sections, the editor of THE JOURNAL, and the resident state secretaries. They have all been active to an unusual degree in placing the standards of the Association before the profession in their respective states. Further, we all appreciate the efforts of the local committee in arranging the many details for this meeting and for the excellent program they have provided for our social enjoyment. We are united in extending our thanks for their splendid and efficient work.

With such perfect coöperation all Association matters can be discussed and eventually settled on their merits. Further, the intricate and difficult problems that are confronting veterinarians can be brought into bold relief with the assurance that their solution will be sought for and ultimately worked out. If there are differences of opinion, honest and frank discussion will lead to mutual understanding, and in all matters of fact, judgment will be suspended until the truth is ascertained.

The past twelve months have been of great moment to our profession. In no single year, heretofore, have so many events taken place to class veterinary service in America with the learned professions. Conspicuous among these are the educational standards that have been accepted; the splendid war

* Fifty-sixth annual meeting A. V. M. A., New Orleans, La., November 17, 1919.

record; and the demands of live stock owners for efficient service. These proclaim in terms of no uncertainty that the veterinarian is coming rapidly into the "promised land" of professional honor and recognition. The shackles that limited his usefulness in the past have been replaced by intellectual freedom, integrity of service and acceptance of responsibilities that are second to none in the great battle humanity has waged, and ever must wage, against disease and the loss and sufferings it occasions.

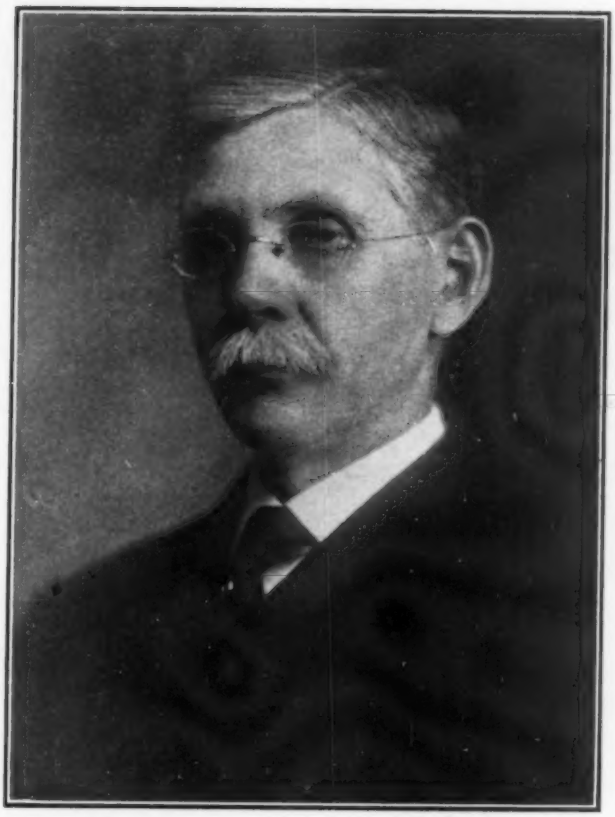
The almost incredible advances recently recorded are the fruition of influences that have been operating for many years. A half-century ago, the seed of a veterinary profession was sown in America. It germinated in the environment of the land grant colleges that were established to develop and promote agriculture, engineering and military science "suited to the needs of the country." The veterinarians who came to those colleges defined the requirements for efficiency in combating the diseases of farm animals. The records show that their struggle to put veterinary medicine on a professional basis was a long and trying one. However, they succeeded by the same influences that changed the primitive tilling of the soil into scientific agriculture and that developed the skilled surgeon of today from the "barber" of old. Our entry into the world war did much to bring matters to a head. However, the "acid test" was not alone in the army, but quite as much in the protection of animals against disease at home. The latter became difficult, owing to the scarcity of veterinarians and to the rapid advance in the value of food producing animals. This interested the owners, who immediately called for the best that science could give to conserve their live stock. It was in this struggle against the forces of disease that the great educational victory was won. The standards of the pioneers became the minimum requirements and some of the states have demanded them for a license to practice. Thus, the advances have come about. While we rejoice in what has been accomplished, we must recognize that these successes will be followed by demands for still greater achievements. It is the difficulties in the readjustment of our profession, in these new conditions, that confront us now.

For many years I have been conscious of the existence of a false conception of professional authority. Numerous appeals have come to defend the rights of veterinarians. The profession has been ignored on a few occasions when we have felt that the

outcome would have been much better if it had been recognized. However, in the last analysis, the decision rests with those having authority. In a somewhat careful study, I do not find that practitioners are vested with it when their professional function is considered alone. In their relation to animal husbandry, it is clear that in civil, as in military life, they are aids, staff officers, and not commanders. In the true sense, veterinarians are the servants of animal owners. According to the tenets of our ethics, they can serve only when requested to do so and, by the property rights, they have no other alternative.

There is a delicacy in this situation that members sometimes overlook. The sense of being a servant is often humiliating, but never so when considered in a true, professional spirit. It is with us, as with physicians, that, as servants, we have as much right to direct and control as our knowledge and personality are able to command. The authority of veterinarians possessed with honesty of purpose, technical knowledge of their profession, wisdom in its application and sympathy with the human element, is much greater than that of a legal statute. When Iole was given in wedlock to the God of Strength, she was asked how she knew Hercules was a Deity. She replied: "When I am in his presence, I am perfectly satisfied." When veterinarians, possessed with the attributes of their profession, appear before animal owners, no question of authority will arise. Our National Bureau of Animal Industry is the result of the personal influence of a single man. Our state veterinary colleges and live stock sanitary boards came into being through a like power. I am bold enough in the faith I have in the future possibilities and usefulness of veterinarians, to believe that the time will come soon when they will command sufficiently the confidence of men in other occupations to enable them to perform fully the mission of their calling. It is this principle, rather than vested authority, that gives them the dignity of professional men.

In the application of the sciences involved in the protection of animals against disease and in calling into existence state and national live stock protection, there have developed several distinct branches of veterinary service, namely: teachers and research workers, practitioners, state live stock sanitarians, federal inspectors and army veterinarians. By this differentiation, the profession has come into actual contact with sanitary and health problems in connection with our animal industry. Although



DR. VERANUS ALVA MOORE
President American Veterinary Medicial Association 1918-19.

these branches differ somewhat in function, they form integral parts of the great composite of veterinary medicine. There is a danger in the tendency to differentiate too sharply and to overlook the common rights and relationship that exist among them all.

Here, as in human medicine, the practitioners constitute numerically the great majority of the profession, while the others are specialists. Nevertheless, the practitioner is the essential teacher of the stockmen in all matters pertaining to the health of their animals and the prevention of disease. He is called often to act as a sanitarian, a meat inspector, a quarantine officer and, until recently, as temporary employee in the army. It is essential, therefore, that he be not embarrassed by the enforcement of official regulations, but encouraged to become a factor in all movements to enhance the conservation of animals. The acme of success will come when the owners coöperate fully in these efforts, and not before. The practitioners are the men among us who can establish the necessary points of contact between them and the sanitary authorities by which progress can be made. One of the difficult problems confronting us is to promote teamwork, to maintain a proper perspective of the functions of each branch of the profession throughout the range of its activities, and retain the appreciation of the common background of purpose which unites them into one harmonious whole. We are each zealous in our prerogative but we should be willing and anxious to coöperate for the common good.

The Association is to be congratulated on the present educational status. Practically all the veterinary colleges now require, for entrance, graduation from a four-year high school, or its academic equivalent. The great factor in bringing this about was the demand of live stock owners themselves for better service. We are surprised at the specifications in the requests for veterinary assistants. The teaching of scientific principles in the care of live stock, that has been going on in our agricultural schools for a half century, is finding expression in the intelligent efforts of farmers to protect their animals. The high values of dairy and meat food products and the decrease in the number of animals in proportion to our population, renders the safeguarding of live stock a matter of first importance in the production of human food and clothing.

Since our last meeting, the great war has come to an end. At the time the armistice was signed, less than fourteen months after the issuing of General Orders 130, authorizing the Veterinary Corps, there were about 2100 veterinary officers assigned to duty in the army, 200 ready for assignment and more than 600 graduates in training for commissions. There was also an enlisted personnel of about 20,000 men. Fully twenty per cent of our eligible veterinarians were in uniform. When hostilities were declared there were 62 officers and no enlisted men in the Veterinary Corps. In order that the achievements of the corps may be understood, the program contains a paper on its work in America and one on the overseas service, which will set forth the facts relative to our activities both at home and abroad.

In organizing quickly a corps composed of old and young men, all unfamiliar with the rigid discipline of army life, not accustomed to having their work inspected frequently or living in accord with the accuracy of details called for in the army, there naturally were some mistakes, errors of judgment, perhaps individual injustices and unfortunate assignments. But was there a Corps in our great National Army in which similar mistakes were not made? Is it strange that some individuals were not satisfied and that others failed? It is a splendid tribute to the profession that, in such trying circumstances, the work was done so well that commanding officers frequently have praised the efficient service of veterinarians in their commands. The recent assignment of Lt. Col. John H. Gould as a student to the general staff college at the War College in Washington is unquestioned evidence of official recognition of the veterinary service by the War Department.

It was fortunate that the Veterinary Corps was placed in the Medical Department. Some have felt that its Director should have been a veterinarian. The Surgeon General realized this more than any other, but the Director had to be familiar with military matters. The few experienced veterinarians in the regular army were needed at other posts where a civilian or medical officer could not function. The Surgeon General, who was responsible for the work, chose, as Director, an officer from his department. To supply him with the necessary veterinary knowledge, he appointed one of our most experienced members as assistant director. Thus, the corps had skilled and experienced leaders in both its administration and professional work. What more or better could have been done?

The members of this Association, and the profession generally, should understand the difficulties in organizing this service. The veterinary officers, like all others, had to be trained in the methods of the War Department so they would do the right thing in the right way and at the proper time. This required a different discipline than most civilians had experienced. When all the circumstances are taken into account, I believe the verdict of a veterinary officer, who wrote me in reference to the service, after returning from France, should be accepted: "Personally I feel that a great deal of good has been done and it is time for everybody to stay behind and push." The gratitude of American veterinarians is due the Surgeon General and the Director of the Corps for their appreciation of our service and the vigorous support they have given and still are giving it.

Among the efforts of the profession in civil life, that of "eradicating the tick" from the South and the establishment of the "accredited herd plan" for the control of bovine tuberculosis are deserving of special mention. Much credit is due the Bureau of Animal Industry for initiating and prosecuting these tasks in coöperation with the states. Nowhere, in live stock sanitary work, has the world witnessed a more important or far-reaching undertaking than the tick eradication. This Association is appreciative of Dr. Cooper Curtice for the vision that the elimination of the tick was the logical method to control Texas fever. In the not distant future, there will be an official proclamation that the blue tick is no longer in the South and that millions of acres of excellent land have been reclaimed for successful animal husbandry. The country has not yet realized the magnitude of this enormously important work. Large parts of the redeemed territory will be filled soon with the finest dairy and meat producing animals in the world. When that time comes, and it is near, the South will become a large live stock producer and require many skilled practitioners and sanitarians.

The "accredited herd plan" is doing for bovine tuberculosis in the country at large what the tick eradication is doing for Texas fever in the South. The plan calls for the assistance of all veterinarians and I appeal to them for coöperation. The method itself may require modification to enable local veterinarians to take a larger part in its operation. It is liable occasionally to give disappointment and receive criticisms from those affected. The arrested cases in herds where tuberculosis has been of long

standing, may now and then remain dormant during the period of testing and later become active and respond. It is important to recognize this element in the biology of tuberculosis and, if such cases appear, to understand what they mean and not allow them to create prejudice against the plan. It is sincerely hoped that this logical and most promising of all methods to eradicate the disease will receive undivided support.

There has been so much progress to encourage veterinarians, that one could speak at great length in praise and felicitation. However, we cannot enjoy the privileges that add genuine pleasure to the tedious routine of professional work, without accepting the responsibilities which accompany them. It seems fitting, therefore, that we should point out some of the problems that are before the profession and for which it will be held responsible not only by the live stock interests but also by the state and society generally. The veterinary profession has an important and distinct function among the human activities that go to make up the composite of our economic and social government. In the past, we have been occupied with technical details, but in these days of readjustment, we must ascertain the veterinary needs of the great animal husbandry of the land and dedicate ourselves to the task of meeting them.

The subject that gives us most concern at this time is the adequate education of veterinarians. I do not refer here to entrance requirements, length of course, sequence of subjects or methods of teaching, for these essential details are under consideration by the proper sections and committees. I am thinking of the means by which men will be able to qualify properly for the profession. Veterinary education is recognized as a state function, or as the privilege of endowed institutions. It is probable that in the near future more of the larger states will provide veterinary schools. The building and properly maintaining of a veterinary college is expensive. Too many schools would be a waste economically and unsatisfactory educationally. There should be a sufficient number of strong, adequately equipped and manned veterinary colleges to train properly as many veterinary students as the live stock interests of the country require. It is suggested that the smaller states, where the animal industry is not extensive and where but a few new veterinarians are required annually, could establish scholarships for the necessary number of students and allow them to attend any school acceptable to the authorities.

It is clearly our duty, as members of this Association, to aid live stock owners and associations and state legislatures to understand their veterinary needs and to ascertain whether a state school, state scholarships or endowment will provide more economically and efficiently for their wants. If one reflects on the many strong, well equipped veterinary colleges in Continental Europe, in proportion to the number of animals, it requires but little prophetic vision to picture the possible demands in this country, within the next fifty years. The part taken by animals in human economy will necessitate the same conservation of their health here that Europe found to be necessary.

Among the essentials in veterinary education are better opportunities for graduate work in the fundamental sciences; systematic instruction in clinical medicine, surgery and therapeutics; and training in methods of work and in research. Allbutt has reminded us that research has two purposes, "one results and the other the method which is itself an education in flexibility, ingenuity, dexterity and perseverance." There should be schools with well-equipped laboratories and clinics manned with teachers and research workers who, as another has said, "should be continually irrigating the profession from the springs of pure science." The great need of more knowledge, the differentiation of faculties, and the necessity for the scientific spirit in our profession call for more and better research and teaching in our schools. With our wealth of animals, America should lead the world in elucidating the problems connected with the diseases of dumb creation and our practitioners should be the most successful.

A matter of much significance is the selection of young men, adapted by education and temperament, to take up veterinary work. Many of our students are influenced either directly or indirectly by some veterinarian. Those who answer the call have certain traits in common. But here, as in other professions, it is the raw material, as well as the preparation, that makes for success. The work is scientific in character, technical in nature and carries a sense of public duty. The reward is that which comes with a nominal fee, or a modest salary and the consciousness of rendering service. Like human medicine, it is not an occupation for gain but one dealing essentially with biological laws, working in the animal body. Unless one can be happy in acquiring and applying this knowledge, he should not be en-

couraged to enter the profession. If our schools are to be filled with students that will do honor to themselves and in after years meet the obligations of their profession, we must all do our part in selecting them.

From the beginning of human history, people have tended to treat their own diseases and those of their animals. Notwithstanding the development of the medical sciences, the practice has continued and often it has been encouraged, by those who have placed remedies and prophylactics on the market for the use of those who cannot make a diagnosis. The discovery of the action of foreign proteins, and the immunizing value of antitoxins and certain serums have given biologic products a high speculative value which enables them to be exploited advantageously. The recorded experience in their use is favorable with some and unfavorable with others. There is a large number of so-called remedies and preventive agents that are used extensively because they are easy to administer and their labels often excuse the veterinarian and raise the owner's hopes. In this way, practitioners often are unconscious dupes of the exploiters.

The general subject has caused many inquiries and numerous criticisms from both animal owners and practitioners. In seeking a remedy for this unfortunate situation, in keeping with the knowledge of the hour and the dignity of the profession, it seems fitting to suggest that this Association consider the advisability of establishing a permanent committee, with workable funds, to investigate unofficial preparations placed on the market for treating or preventing diseases of animals and report their findings in our official journal. Such a committee would protect the manufacturers of valuable products and give a better standing to veterinary therapeutics. A few pages in our journal giving the findings of such a committee would be of great help to practitioners and of much benefit to stockmen who are becoming sorely perplexed because of the unstable knowledge of these commodities.

There is a good precedent for suggesting such a committee. In order to protect the public against the sham of patent medicines and the besetting evils of unofficial preparations, the American Medical Association established a "Council of Pharmacy and Chemistry" which undertook a systematic analysis and test of such preparations. The facts as determined by the council were, and still are, published in their journal. As many

of you know, this has proven to be of incalculable aid to physicians and a great saving to the people. In a similar manner, the agricultural experiment stations have dealt with "stock feeds" and commercial fertilizers.

There is a greater demand on veterinarians than ever before from both live stock owners and the consumers of dairy and meat food products to reduce the enormous losses from animal diseases. The economic significance of these maladies has extended beyond individual losses and affected our great animal industry, which naturally looks to veterinarians for relief. Laymen do not understand the difficulties in acquiring the knowledge necessary to prevent or treat successfully many animal plagues and consequently they become impatient in waiting for more efficient methods. Research and experimental work on these diseases are expensive both in time and money. The institutions engaged in this work are not numerous and they are uniformly limited in funds so that the volume of research is restricted. To hasten the time when the required knowledge of the important affections of abortion and sterility in cattle can be had, it would seem that a correlation of projects could be arranged whereby the desired facts could be ascertained more quickly than by present procedures. Further, a guiding committee might enlist the cooperation of practitioners and breeders in applying the recommendations that come from such researches on a scale large enough to determine their real value before they are given to the profession. I am making the above suggestion in connection with the maladies that at this time are causing the heaviest losses, as a possible means of hastening the formulation of workable methods for their prevention. Our task is the protection against disease of live stock representing billions of dollars in value and which is paying an annual toll of hundreds of millions of dollars in losses due to preventable diseases. Our united resources are far too small to insure immediate relief. We have been accessories to the neglect of research so that now when the pressing demand for higher efficiency is upon us, we are not prepared. It is to overcome as far as possible this deficiency that the suggestion is made to federate, as it were, our fragments of knowledge and research to the end that the wanton loss from disease may be checked.

In addition to our limited information on many diseases, there is a lack of facility for the general utilization of the avail-

able knowledge. I have emphasized the importance of research but equally significant is the training of the profession to apply that which is already known. In this respect, research should have a co-partner in skilled and willing hands to apply new truths. It is the necessity of knitting together research and practice that leads me to conclude that, for the best results, it should be made largely by those who also have the responsibility of instruction. It brings the worker and the student together and teaches the latter how better to observe and interpret the phenomena of disease. The field of practice is the greatest research laboratory of the profession. It should be permeated with the scientific spirit which is nothing mysterious or remote. It is every day hard sense. Unfortunately that does not make it common, but it does make it attainable.

There are numerous opportunities to extend the usefulness of our Association if its members will take a larger part both in local and national welfare work. Our members are eminently qualified for places on boards of health, for service in the American Public Health Association as well as in live stock sanitary organizations. The public is not acquainted with the value of veterinary service, or the difficult problems it has to solve in which every individual has an actual interest. We should avail ourselves of all opportunities to instruct the public in the work of the profession and to establish points of contact between it and society generally. People should know what veterinarians can do, and are doing, to protect human life against the diseases of animals communicable to man, as well as in saving property. Again, veterinarians should be more active in molding public opinion on all matters relating to the diseases of animals and in directing wise legislation and regulations to safeguard the health of live stock. There are many men who are doing noble work in this direction but its importance to the country renders it necessary that we all participate.

In 1916, there was established, under the Congressional Charter of the National Academy of Sciences a National Research Council with the coöperation of the national scientific and technical societies of the United States. Our Association is not represented in this council. I have had considerable correspondence with the officers and find they are very sympathetic with the suggestion for a veterinary representative. The matter will be taken up by the Division of Medical Sciences at its next

meeting, which is the last of this month. A technical difficulty at present is that the council has contracted for all of its available funds. Because of the great importance to the nation of veterinary service, I would recommend that this Association appoint a committee consisting of the President and Secretary to continue the negotiations and to select a representative for the council in case one is granted. The term of office is three years. I would recommend further, in order not to delay our participation in the work, that the Association pay the expenses of its member to attend the meetings until such time as the budget of the council can provide for our representative. As a rule, these meetings do not occur oftener than once in six months. It seems very desirable for us to have an active worker in the National Council. I regret that further progress cannot be reported at this time.

I am constrained to call attention to a matter pertaining to the work of the Association that is before us for action. We are living in new times. The public expects more of us, collectively and individually, than ever before. This emphasizes the importance of a wise decision on the resolution to combine in one office the editorship of THE JOURNAL and the secretaryship. It is largely through these officers that the standards of the Association are placed before the profession and the public. The secretary has occasion to meet personally, or by letter, a large number of veterinarians, live stock men and others in connection with professional and Association matters. He has to deal with those friendly disposed and those who are hypercritical of our shortcomings. His unenviable yet important task is to leave always the right impression regarding the character and purpose of veterinary service. Likewise, the editor becomes our spokesman, through the printed page. He determines largely the character of our following, our standing among the educational and scientific associations of the country and our peers in other lands. We decided, and I believe wisely, to have an official journal. It is our duty to see that the excellence of its subject matter and the ethical purity of its advertisements be maintained and advanced as future progress demands. Can all the duties that now fall upon the secretary and editor be performed more efficiently by one man giving it his full time or by two men, each on part time? This is the question to be decided.

There are many topics such as the advisability of continuing certain committees; the elimination or minimizing of the expense

of the local committee; a working program for resident state secretaries; and many others that could be discussed if time permitted but they must be left to the good judgment of the Association.

Finally, my feeling regarding the veterinary profession in the time to come is expressed in a statement relative to the future of America made by Huxley, in 1876, at the opening of Johns Hopkins University. "Truly," she "has a great future before her; great in toil, in care and in responsibility; great in true glory if she be guided in wisdom and righteousness; great in shame if she fail."

THE DIFFERENTIAL FEATURES BETWEEN MELANOSIS AND MELANOSARCOMA.*

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(Continued from page 153.)

PART TWO: CASES.

Case 1. A grey gelding that died of acute serofibrinous pleuritis. Autopsy 446. There were three black nodules, each about 2 cm. in diameter, in the intermuscular connective tissue in the region of the right shoulder. On section these were uniformly jet black, dense, and the cut surface smooth and shiny. These were the only melanotic lesions found. They did not show on the living animal and apparently produced no discomfort.

Microscopically these nodules were composed of brownish black masses held in a dense connective tissue network containing numerous blood vessels. There were irregular shaped spots of pigment in this connective tissue as well as in the surrounding muscle fibers. In bleached sections, the areas formerly occupied by melanin were composed of large spindle shaped cells containing large oval nuclei. Numerous processes emanated from some of these cells. The cytoplasm of these cells was finely granular. Mixed in with these cells there were relatively few large oval or rounded cells with a finely granular cytoplasm. Some of these contained small round nuclei while others were free from nuclei. These cells closely resembled epithelioid cells.

* Presented before the twenty-ninth annual meeting of the New York State Veterinary Medical Society, July 24, 1919.

Near the edge of the nodules the spindle shaped cells were arranged in rows between the muscle fibers.

This is apparently a primary melano-sarcoma. It is one of a large number of cases of grey horses in which somewhere in the body there are found melanotic tumors, that have not been detected during the life of the individual. These are usually found in the region of the shoulder or the anus. They originate in the skin and infiltrate the neighboring muscles or the neighborhood lymphatics. Ewing points out that the reason for the pigmented nevi taking on malignant characters is the irritation produced by the patient, by surgeons, or by other specialists. It is possible that the reason for their occurring in the shoulder or at the base of the tail in grey horses is because of irritation in these areas produced possibly by the harness of these animals.

Case 2. Accession number 253. A grey mare that was very stiff and sore when brought to clinic. She was in poor condition. There was a watery discharge from the left teat. There was a large tumor in the mammary gland. There was one also at the internal inguinal ring weighing 2¾ pounds.

The left mammary gland was greatly enlarged, 25.5 cm. x 17 cm. x 12 cm. Weight, 7 lbs. On section, it contained a large lobulated black mass 15 cm. long and 11 cm. in diameter. In the center there was a cyst 6 cm. in diameter containing liquid. The solid area contained strands of whitish connective tissue running in every direction. There was another lobulated nodule 10 x 4 x 4½ cm. dorsal to the main one and one 10 x 8 x 5 cm. a little above the teat. The center of this mass was necrotic. There were smaller black nodules varying from .5 to 3 cm. in diameter around the main mass. The glandular tissue was almost entirely replaced by the black masses. (Fig. 1.)

All of the lymph glands were enlarged and melanotic. One of the lymph glands was preserved. This was greatly enlarged and lobulated. It measured 14 cm. long and 10 cm. in diameter. On section the lymphatic structures were apparently gone. In its place was one main nodule and several smaller ones. The main nodule was spherical and somewhat nodular. It measured 9 cm. in diameter. Each of the smaller ones was about 3 cm. in diameter. These nodules were brownish black and streaked with bands of whitish connective tissue running in all directions.

The left lung contained two blackish tumors, 3.75 and 8.75

PLATE I

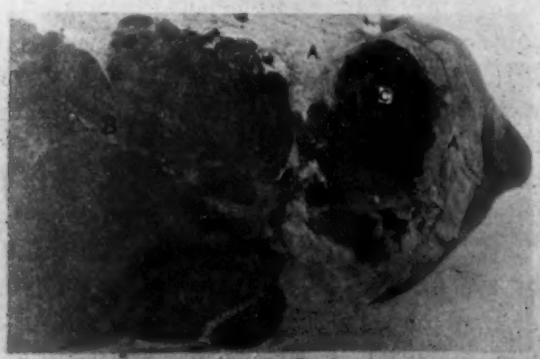

Fig. 1.

Fig. 2.

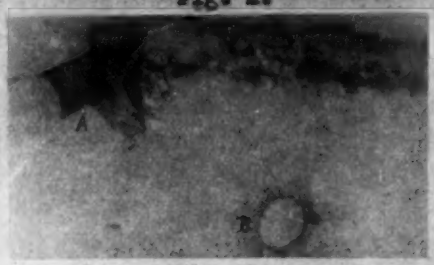

Fig. 3.

cm. in diameter. These were spheroidal with depressed centers, containing some whitish, translucent material. The right lung contained a small tumor 1.25 cm. in diameter on the external surface of the apical lobe.

The spleen weighed 4.5 lbs. It contained eleven black spheroidal tumors 4.8 cm. in diameter, projecting 1-3 cm. from the surface.

In the skin there was an irregularly lobulated nodule 6x6x4 cm.

The liver was greatly enlarged, firm in consistency, and roughened by numerous black nodules varying in size from 3 mm. to 5 cm. in diameter, projecting on the surface. These nodules were uniformly distributed over the surface of the liver. On section these nodules were distributed throughout the liver tissue (Fig. 2). The weight of the liver with the omentum and part of the diaphragm was 53.5 lbs.

There was a lobulated black mass 5x3½x2½ cm. nearly completely encircling one of the larger abdominal arteries. The pancreas contained a melanotic mass. Two ribs were fractured and contained melanotic deposits.

In one area near the cartilage of prolongation, the bony tissue of the scapula was blackened throughout its width and thickness. The periostium in this place was also black. Adjacent to this area there was an irregularly shaped black nodule 2.5 cm. in diameter in the attached muscle. In other parts of the skeletal muscles there were comparatively few nodules 5-8 mm. in diameter.

The diaphragm, omentum, peritoneum and pleura were sprinkled with black tumors, from a mere point in size to irregular deposits 8-10 cm. long.

Each kidney contained a few rounded black nodules .5 mm. to 1 cm. in diameter. These were distributed in the cortex and the pelvis, a few projecting from the surface.

In the heart, the myocardium contained numerous nodules varying in size from 1 mm. to 1.5 cm. Most of these were under the endocardium projecting into the heart. All the chambers of the heart were about equally affected. There were only relatimely few nodules under the epicardium projecting outwardly. There were two nodules on the surface of the aortic arch. With the exception of a nodule at the base of one of the mitral valves, the valves were not affected. (Fig. 4). The heart weighed 10 lbs.

The adrenals contained numerous black nodules varying in size from .5 mm. to 1.5 cm. in diameter. These were uniformly distributed throughout the cortex and the medulla.

Microscopically, in the mammary gland, the tumor was composed of round cells with round nuclei as well as large spindle shaped cells with large oval nuclei, with a dense richly vascular

PLATE II

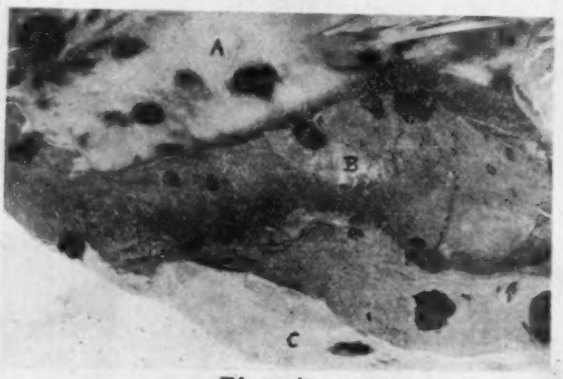

Fig. 4.

Fig. 5.

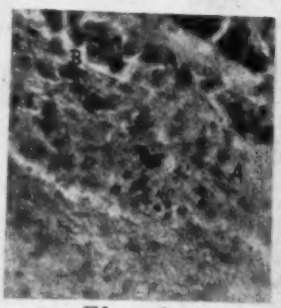

Fig. 6.

Fig. 7.

connective tissue stroma. There were a few giant cells with a central arrangement of the nuclei. Some of the round cells were arranged around the blood vessels. In places the round cells and the spindle shaped cells have infiltrated the connective tissue stroma. The pigment was in the form of brown granules scattered in the cytoplasm of the cells, in some places completely filling the cytoplasm. In some of the cells the nucleus also was covered by the pigment. The round cells were more richly pig-

mented than the spindle shaped cells. There was also an infiltration of pigment in the surrounding connective tissue stroma, in places. The few giant cells were free from pigment. There was some evidence of cell division by mitosis.

In the lung there was a distinct perivascular arrangement of the tumor cells, otherwise it showed the same general features as the mammary tumor. In one place there were seen large round cells with coarsely granular chromatin material scattered through the cytoplasm. These were apparently vascular endothelial cells. No giant cells were seen in this preparation.

In the liver the general features of the tumor were the same as in the lung. The bluish granules in the cytoplasm were more abundant and more striking than in the other organs. These were scattered throughout the section in sharp contrast to the brownish melanin granules. They were more prominent where the brown granules were scanty. At the periphery of the nodule the cells showed an infiltrating growth. There was also marked proliferation of the bile ducts at the periphery of the nodule.

The renal and adrenal tumors showed the same features as those of the liver. (Fig. 7).

This is evidently a melanosarcoma primary in the mammary gland. It is an extremely interesting case from a pedagogical point of view. It is that of a melanosarcoma that had undergone metastasis by both the blood and lymph streams and affected nearly every organ in the body. In the various organs it shows how the tumor cells multiplied and produced growths. Later, another crop of cells were deposited. These in turn also multiplied at the points of deposit and produced nodules. In this case, there were about four or five crops, and the last ones were apparently scattered broadcast.

The number of these nodules do not indicate the number of cells distributed. It is very well known that the tissues in the body fight these cells just as they do parasites. These so-called resisting forces of the body destroy many of the invading cells. It is perhaps a comparatively small number of the cells lodged in the tissues that survive, multiply and produce nodules. Even then the resisting powers do not rest. These nodules are surrounded by a connective tissue wall to keep them from spreading. In the case of malignant tumors, the tumor cells infiltrate the connective tissue so that this wall is broken down.

The determination of the organ in which the tumor originates is comparatively easy in the epithelial tumors, from the nature of the cells. In the case of the connective tissue tumors, it is very difficult because every organ in the body has a supporting connective tissue structure. Other means of determining the origin of a tumor is by the size of the tumor, and whether secondary changes have taken place. These would indicate the age of the tumor, and of course the organ in which the tumor is oldest, is the point of origin. In this case the tumor in the left mammary gland is the largest and it contains a large cyst, so that we consider this as being the mother tumor. From this point it spread to the lymph glands, then to the lung and spleen, then to the liver and peritoneum, then to the other organs. This is determined by the largest tumors found in the respective organs. These conclusions are not always correct, for the reason that some of the tissues may offer a better medium for the multiplication of these cells. In other words, some tissues may be more resistant than others. It is very well known that in some cases the primary tumor may become arrested and resume a dormant state. This would make the primary tumor smaller though older than the others, and secondary changes also may not take place in the primary growth.

Case 3. A 20 year old grey percheron gelding weighing 1200 lbs. The history was that some time back the animal slipped and went lame. There was evidence of gradual recovery when, three weeks previous to death, the animal fell into a coal chute. A week later there was another accident. There was then noticed progressive posterior paralysis, particularly of the right hind leg. There was atrophy of the right gluteal region. The animal was destroyed. Autopsy immediately after.

There were three subcutaneous melanotic tumors. One 9 cm. long and 5 cm. in diameter near the cartilage of prolongation of the scapula. Another 3 cm. long and 2.5 cm. in diameter in the supra-anal region. The third one was smaller, and situated on the linea alba anterior to the prepuce.

The spleen weighed 4.4 kg. In contained large round tumors varying in size from 3 cm. in diameter to 15x10x12 cm. On section, these tumors were of a greyish black color, and the centers of the larger ones were cystic containing a blackish liquid. The nodules were uniformly distributed throughout the organ.

The sublumbar lymph glands were in the form of two large black tumors 21x17x15 cm. and 15x10x9 cm. These were firmly adherent to the adjacent vertebræ and contained some calcified areas. The two glands weighed 4 kg. The adjacent lumbar vertebræ were of a black color. At the point of origin of the lumbo-sacral plexus there was a melanotic tumor 5 cm. long, 3.5 cm. at its widest point, and 2 cm. thick. Four cm. behind this one there was a tumor 3.7x3x2 cm. These tumors were in the spinal canal. They involved the spinal meninges and surrounded the spinal nerves. The larger one also infiltrated the body of the vertebra at that point. In the lumbar region 10 cm. above the largest tumor there was, in the spinal canal, a black mass 4x2.5x2 cm. grown into the spinal meninges. (Fig. 5). All these tumors were sufficiently large to produce pressure upon the cord and the sacro-lumbar roots which they involved. There were several pigmented areas 1-3 cm. in diameter beneath the sublumbar peritoneum.

The pancreas contained a black nodule 2 cm. in diameter. The left adrenal contained two melanotic nodules each about 1.5 cm. in diameter.

In the latissimus dorsi muscle there were several black nodules varying from 1 mm. to 1 cm. in diameter. The right poplyteal lymph glands were in a black mass 12x8x6 cm. not infiltrating the surrounding muscles.

Microscopically, in the adrenal the black tumors were made up of large spindle shaped, oval, and here and there smaller round cells. The nuclei in these cells occupied from one third to two thirds of the cell, and the nucleoli were very prominent in the oval and in the spindle shaped cells. Nuclear division by mitosis as well as by amitosis was seen. These cells were arranged in large nests and surrounded by a rather scant vascular connective tissue stroma. The nests were also richly supplied with blood vessels. Under the low power the tumor in the adrenal closely resembled that of a glandular carcinoma. At the periphery the tumor cells invaded the surrounding structures. The pigment was in the form of fine brown granules in the cytoplasm of the cells. In some of the cells the pigment was in masses covering the entire cell including the nucleus. (Fig. 6). In the surrounding adrenal cells there were coarse chromatin

granules in the cytoplasm. There was marked congestion in the adrenal tissue.

In the bone the tumor cells invaded the marrow spaces. In the section studied, these cells did not invade the dense bony tissue or the articular cartilage.

In this instance the nodules in the spleen showed central necrosis while the subcutaneous lesions were quite small. It is quite possible, however, that the primary lesions were in the perineal region with secondary involvement of the sublumbar and poplyteal lymph glands and later the other organs. It is possible that the shoulder lesion was also primary, since it is remote from the other chain of tumors, and there were no nodules in the thoracic cavity.

This is evidently a melanosarcoma originating in the perineal region.

Case 4. Viscera of a fowl. Accession number 460.

There was an irregular black mass 8x6x4 cm. attached to the mesentery. The rest of the mesentery was sprinkled with black growths varying in size from .5 mm. to spherical nodules 3 cm. in diameter. Some of these were soft, others were firm in consistency. There were numerous similar growths on the serous surfaces of the intestines, proventriculus, and gizzard, some of them infiltrating, others only surrounding the muscle coats of these organs. There were growths also on the serous surface of the liver. The ovaries were sprinkled with black nodules varying in size from .5 mm. to 2 cm. in diameter. The other organs were not available so that it is impossible to determine with certainty the origin of this tumor, or the color of the individual.

Microscopically, these tumors were composed of irregularly shaped large cells with round nuclei occupying about one third of the cell. These cells were arranged around various sized blood vessels and blood spaces, with a scanty connective tissue stroma. Minus the pigment, it resembled a cavernous angiosarcoma. (Figs. 9 and 10). The cells resembled epithelioid cells, some of them appearing like columnar epithelial cells. The pigment was arranged in the cytoplasm in the form of fine and coarse granules and in masses covering up the nucleus.

This is a case of perivascular melanosarcoma. In this case the largest tumor was in the mesentery. It is possible that this was the mother tumor, with metastases in other parts of the

PLATE III

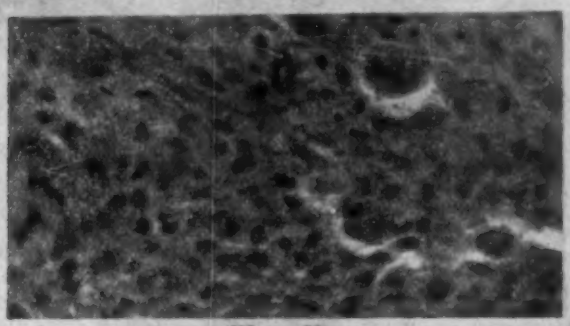

Fig. 8.

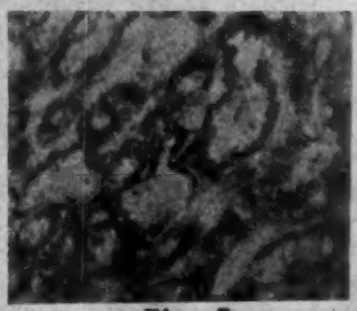

Fig. 9.

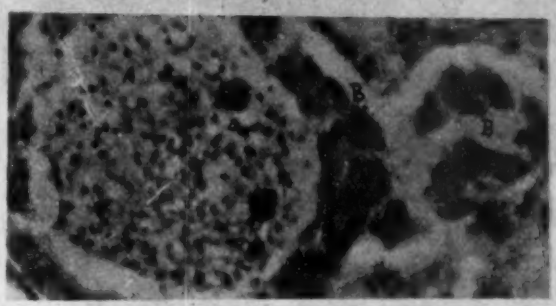

Fig. 10.

peritoneum and in the ovary. The determination of the point of origin is, however, impossible without the other organs. The tumor itself is extremely interesting, since it is composed of cells resembling epithelioid cells in a peculiar perivascular arrangement. In places these cells form the entire wall of the vessels or blood spaces as the case may be. In the literature I was unable to find a case of melanosarcoma in a fowl or a melanosarcoma

presenting this histological picture, in any of our domestic animals.

Case 5. An about one year old male turkey (*Meleagris domestica*) weighing 12 lbs. The purchaser returned the carcass on account of black discoloration of the viscera. The butcher did not notice anything wrong while dressing the carcass. The dressed carcass minus the head, feet, and the viscera that is generally removed while dressing, was received for diagnosis. The carcass was in excellent condition.

The costal pleura was of a black color. This was most marked anteriorly and gradually diminished toward the distal end of the thoracic cavity where it appeared of a bluish black color. The lungs were black, the pigment appearing in an arborous form under the pleura. The cephalic end of the lungs was more markedly pigmented than the distal end. On section, there were spots of pigment uniformly scattered throughout the lung tissue. The aorta, the larger arteries, as well as the spinal meninges, were covered with black material. The kidneys and testes contained scattered black spots. The other organs were appaerntly free from this pigment.

Microscopically in the kidney, the pigment was in the form of fine and coarse granules around the blood vessels, principally around the medium sized arteries.

In the testes, the pigment was found to be in the interstitial tissue around the seminiferous tubules, and in spots in the tunica albuginia. (Fig. 11).

In the lung the pigment was situated in the interlobular connective tissue, mostly around blood vessels. A little of the pigment was in the alveolar walls next to the interlobular tissue. There were also masses of pigment in the subpleural connective tissue in places.

In the large vessels the location of the pigment was in the tunica adventitia particularly around the fat cells, the vasovasorum, and around the nerves and between the nerve fibres. (Fig. 12). In bleached preparations, it was found that this pigment was situated in splindle shaped branched cells. (Fig. 14). These cells were very much smaller than those found in the cases of melano-sarcoma. The pigmented areas in this case are not in the form of nodular swellings, the organs affected are, aside from the pigmentation, normal in every respect. In addi-

PLATE IV

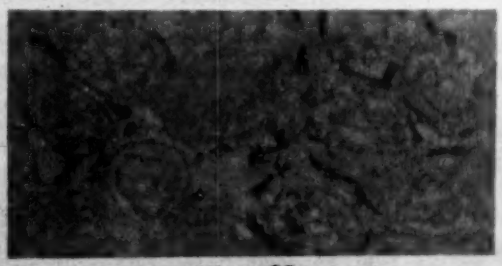

Fig. 11.

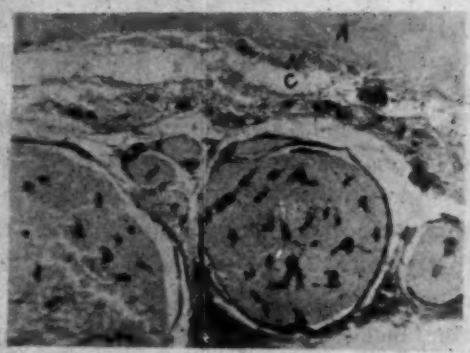

Fig. 12.

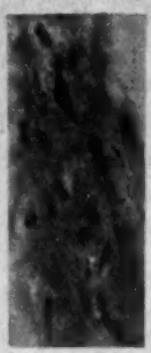

Fig. 13.

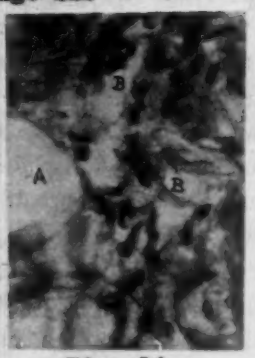

Fig. 14.

tion, the body generally is in good condition without any evidence of cachexia or intoxication which is so common in malignant tumors. The diagnosis in this case must be melanosis.

Case 6. A spinal cord of a calf that was sent in for diagnosis.

The meninges were black throughout. On section the pia was black throughout extending into the ventromedial fissure. The arachnoid also contained pigment throughout. The inner surface of the dura was slightly pigmented. Externally this

gave the cord a bluish color. The cord itself appeared normal. (Fig. 3).

Microscopically, the pigment was found, as in the previous case, in small spindle shaped branched cells situated mostly around fine blood vessels. The cord proper as well as the lining of the central canal, were free from pigment.

This is also a case of melanosis. In this case also the organ that contained the pigment was otherwise in a healthy condition, and the carcass was fit for food. The pigment, while affecting practically all the meninges did not produce a visible thickening. It was not in the form of a nodular growth. The conclusion must therefore be that it is melanosis and not melano-sarcoma. Such melanosis occurs quite frequently in calves. Usually it is in the form of black spots in the subcutaneous, subperitoneal, subpleural, and intermuscular connective tissue. This condition is known as *melanosis maculosa.* It is brought about by oval or spindle-shaped specialized cells known as chromophores. (Fig. 13). This pigment seems to disappear in later life, so that it is very rare in adult cattle.

In the latter, melanosarcoma occurs while young calves are apparently free from it. In the human subject also, melanosarcoma does not make its appearance until about 25-30 years of age. This fact shows the possibility that melanosarcoma may sometimes result from melanosis.

In the course of the routine autopsies performed, we have encountered melanosis in adult horses that is worthy of mention. These were in the form of irregular oblong black areas 1-3 cm. long and .5-1 cm. wide, located in the subserous connective tissue of the ileum. They were observed in black, brown and sorrell mares and geldings. Microscopically, the pigment was situated in oval shaped cells in the form of fine brownish black granules.

From a review of the literature, it will be seen that none of our domesticated animals is free from melanosis and melanosarcoma. It will also be seen that it is more frequently encountered in the darker colored individuals, particularly in those horses that are born dark and later change to grey or white.

Virchow ascribed their occurrence in white horses as evidence of a constitutional weakness.

Eppinger regards the excess of pigment and its products especially indol and skatol, as the cause of the overgrowth of the cells.

Stoeber and Wacker observed that indol and skatol cause marked proliferation of epithelial cells.

Their almost constant occurrence in grey horses may be due to a family inheritance, the same as mouse carcinoma.

From the above observations, the following conclusions seem to be justified.

1. That both melanosis and melanosarcoma occur in our domestic mammals as well as in fowls.

2. That the melanin is, in both of these affectations, produced by oval spindle-shaped pigment cells (chromatophores).

3. That melanosis should be regarded only as that form of pigmentation where there is no nodular growth, metastases, or cachexia resulting from intoxication which is often found associated with malignant tumors.

4. That melanosarcoma should be regarded only as that form of pigmentation associated with nodular growth, infiltrating more or less the neighboring structures, producing metastases, or showing evidence of intoxication.

DESCRIPTION OF PLATES

PLATE I

Fig. 1. Section of left mammary gland. Case 2. One half natural size.
- A. Remaining glandular structure containing an increased amount of fibrous tissue.
- B. Large sarcomatous mass showing central cyst formation.
- C. Necrosis in the center of a smaller melanotic mass.

Fig. 2. Section of liver. Case 2. One half natural size.
- A. Nodules projecting on the surface.
- B. Central melanotic nodules.

Fig. 3. Spinal cord calf. Case 6. Natural size.
- A. The dura mater cut to expose the jet black arachnoid and pia.
- B. Cross section of the same cord showing the arachnoid and pia mainly involved.

PLATE II

Fig. 4. Metastatic nodules heart. Case 2. One half natural size.
- A. Endocardium of left ventricle.

B. Myocardium.
C. Epicardium.

Fig. 5. Melanosarcoma spinal cord, horse. Case 3. One half natural size.
A. Spinal meninges.
B. Exposed normal spinal cord.
C. Tumor nodules involving the meninges.
D. Tumor nodule surrounding a spinal nerve and involving a vertebra.

Fig. 6. Melanosarcoma adrenal horse. Case 3. x 350.
A. Cortical tissue of adrenal.
B. Large cells containing granules of melanin infiltrating the cortical tissue.

Fig. 7. Melanosarcoma adrenal horse. Case 2. x 650.
A. Cortical cells of adrenal.
B. Large tumor cells containing melanin.

PLATE III

Fig. 8. Bleached melanosarcoma of pig. (Dr. Pickens' case) x 650. Note the large spindle-shaped cells of which the tumor is composed, with here and there large rounded giant cells in spaces.

Fig. 9. Melanosarcoma mesentery fowl. Case 4. x 105. Note the alveolar structure of the tumor.

Fig. 10. Bleached section same as fig. 9. x 650.
A. Nucleated red corpuscles.
B. Large irregular shaped cells forming vessel walls.

PLATE IV

Fig. 11. Melanosis of testis turkey. Case 5. x 155. Note the arrangement of the pigment around the seminiferous tubules.

Fig. 12. Melanosis artery turkey. Case 5. x 105.
A. Tunica media.
B. Pigmentation in and around nerves of tunica adventia.

Fig. 13. Bleached specimen of melanosis maculosis in the intermuscular connective tissue of a calf showing large spindle-shaped pigment cells. x 650.

Fig. 14. Bleached preparation of fig. 12. x 650.
A. Fat cell.
B. Spindle-shaped pigment cells.

THE USE OF CARBON BISULPHID IN INFESTATIONS WITH BOTS, GASTROPHILUS SPP.

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The carbon bisulphid treatment for the removal of bots from horses was proposed by Perroncito and Bosso in 1894 and has been advocated by many writers since on the clinical findings. Experimental evidence in support of the idea that it was 100 per cent effective against bots when given in adequate amounts was published by Hall (1917). He gave a horse two doses of 20 mils (about 5 drams) each of carbon bisulphid with a 2-hour interval and followed this two hours later with 800 mils of linseed oil, removing 10 bots and leaving the horse free from bots on post-mortem examination. Hall, Smead and Wolf (1919) have published additional experimental confirmation of the reliability of this drug in removing bots. They used eight horses. Of these, two horses received one dose of 6 drams of carbon bisulphid, four horses received two doses of 4 drams each with a 2-hour interval between the doses, and two horses received three doses of 3 drams each at 1-hour intervals, the latter dose being the one recommended by the U. S. Department of Agriculture. No purgation preceded, accompanied or followed the treatment, the only preparation being to fast the animals from noon of one day until treatment the following morning. The treatment removed all of the 690 bots present in six of the horses, the other two horses being free from bots. They note that one 6-dram dose was as effective as two 4-dram doses or three 3-dram doses, and suggest that further experiment might show that a single dose of less than 6 drams would be adequate. Incidentally, they found carbon bisulphid 97 per cent effective against ascarids in the horse, removing 91 of 94 ascarids present in the eight horses, and suggest that the simultaneous use of a purgative might increase its efficacy against these worms.

In order to ascertain the minimum effective dose, we have carried out some tests of carbon bisulphid on four horses at the Bureau Experiment Station at Bethesda, Maryland, using less than 6 drams to a treatment, and have also sought to determine whether the simultaneous use of a purgaitve would increase the efficacy of the drug against ascarids.

The horses were fasted about 24 hours and not given food or water for 4 hours after treatment. The protocols of these experiments are as follows:

Horse No. 207 was given a dose of 5 drams in a hard capsule. Examination of the manure for the following days showed bots as follows: None; 2 *G. intestinalis,* 1 *G. nasalis;* 16 *G. intestinalis,* 8 *G. nasalis;* 8 *G. intestinalis,* 3 *G. nasalis;* none; 2 *G. intestinalis;* 1 *G. intestinalis;* none; none; a total of 27 *G. intestinalis* and 12 *G. nasalis.* The horse was killed on the tenth day after treatment and found to have four live bots, all *G. nasalis.* The treatment was therefore 100 per cent effective against *G. intestinalis* and 75 per cent effective against *G. nasalis.* To extend these findings, a smaller dose was used as follows:

Horse No. 206 was given 4 drams of carbon bisulphid in a hard capsule. The next day the fecal findings were negative; the next day the manure contained 11 *G. intestinalis;* the third day, 1 *G. intestinalis;* the fourth day, 1 *G. intestinalis;* the findings for the next five days were negative; a total of 13 *G. intestinalis.* The horse was killed on the ninth day and found to have 27 live specimens of *G. nasalis* attached to the duodenum and 1 to the jejunum. The treatment was therefore 100 per cent effective against *G. intestinalis* and 0 per cent effective against *G. nasalis.*

Since single doses of 4 or 5 drams were entirely effective against *G. intestinalis,* with a marked drop of efficacy, from 75% to 0 per cent, against *G. nasalis,* in lowering the dose from 5 to 4 drams, a 5-dram dose was divided, horse No. 203 receiving 3 drams in a hard capsule, followed two hours later by 2 drams additional, the idea being that this would prolong the period of exposure to the drug, although it diminished the concentration of the gas in the stomach. Examination of the manure on succeeding days showed the following: For the first two days (a Saturday and Sunday) together, 51 *G. intestinalis,* 17 *G. nasalis,* 1 ascarid; on succeeding days, 47 *G. intestinalis,* 11 *G. nasalis;* 41 *G. intestinalis,* 4 *G. nasalis;* 10 *G. intestinalis,* 7 *G. nasalis;* 2 *G. nasalis;* 2 *G. intestinalis,* 9 *G. nasalis,* and 3 bots lost and not identified (disregarded in subsequent figures); none; a total of 151 *G. intestinalis,* 50 *G. nasalis,* and 1 ascarid. The horse was killed on the eighth day after treatment and found to have 93 live bots attached in the stomach, duodenum, jejunum and ileum, of which 79 were *G. nasalis* and 14 *G. intestinalis.* There

were also 16 dead bots in the cecum, colon and rectum, of which 11 were *G. intestinalis,* the other 5 bots being lost and not identified. These 5 bots are disregarded in computing efficacy. The treatment was therefore at least 92 per cent effective against *G. intestinalis* and 39 per cent effective against *G. nasalis,* and entirely effective against ascarids. This is a decline in efficacy against *G. intestinalis* from the single dose of 4 or 5 drams, but an increase in efficacy against *G. nasalis* over the single dose of 4 drams.

As a final test, horse No. 211 was given 5 drams of carbon bisulphid in a hard capsule and this was followed within a half hour by a pint of linseed oil. The day after treatment the horse passed 1 *G. nasalis* and the next day 1 *G. intestinalis.* No parasites were passed during the next three days and the horse was killed the fifth day after treatment. The horse had approximately 150 bots in the stomach, 225 in the duodenum and 4 in the small intestine below the duodenum, a total of between 350 and 400 bots, of which the majority were *G. nasalis,* the others being *G. intestinalis.* There were also 3 ascarids in the small intestine. The treatment was therefore practically an entire failure, removing no ascarids and only 2 bots, a negligible number in view of the infestation present. Since the only important respect in which this experiment differed from the other experiments detailed here was in the administration of linseed oil, and since the other experiments showed an efficacy of 92 to 100 per cent against *G. intestinalis,* it must be concluded that the administration of linseed oil with carbon bisulphid, or soon after, is distinctly contraindicated. We may tentatively assume that the linseed oil mechanically protects the bots from the full effect of the carbon bisulphid. As a rule, writers do not recommend the use of linseed oil with carbon bisulphid, but it has been recommended by Macdougall (1918), who gives the following procedure: Add 1 ounce of carbon bisulphid to 11 ounces of linseed oil and give 2 ounces of this mixture every 2 hours until all of it has been given, the horse being fasted for 12 hours before treatment. This is a long, tedious process and our experiments would indicate that it might give less satisfactory results than a treatment with smaller doses where the linseed oil was omitted. He also notes that in two cases where a pint of linseed oil was given after the last dose of this mixture, superpurgation was set up, 1 animal dying in three days and the other recovering after a long course of treatment. Hutyra and

Marek (1914) note a method in which the carbon bisulphid is followed by 250 to 500 grams of castor oil or by 6 to 10 grams of tartar emetic after 12 to 24 hours. After such an interval it is unlikely that the action of the drug would be interfered with by the purgative, but on the other hand there seems to be no necessity for the administration of a purgative and there is a reason why the injury due to the carbon bisulphid (we find the characteristic inflamed area the size of a hand in the cardiac stomach, as was described by Hall, Smead and Wolf, 1919) should be added to by the administration of an irritant such as tartar emetic. The procedure heretofore recommended by the U. S. Bureau of Animal Industry calls for preliminary purgation the evening before treatment with a pint of linseed oil or an ounce of Barbadoes aloes. In view of the present experimental evidence there appears to be no need for this purgation and it might as well be omitted, though there is no reason to suppose that linseed oil given at that time would interfere with the action of the carbon bisulphid. As already noted, Hall (1917) found that with two doses of 20 mils of carbon bisulphid with a 2-hour interval, followed two hours later by 800 mils of linseed oil, all bots, including *G. nasalis,* were removed.

An interesting feature of our experiments is the fact that *G. nasalis* was not removed or not entirely removed by doses that removed all of the *G. intestinalis* present. We do not regard this as due to any greater resistance to the drug on the part of *G. nasalis,* but to its location around the pylorus and in the duodenum. The characteristic lesion due to carbon bisulphid shows that it tends to remain in the cardiac stomach for some time, thus subjecting the bots there to the full force of its action. From here on the drug is subject to absorption, which decreases the amount available, to dilution with the fatty content of the intestine, which decreases its concentration, and to the comparatively rapid peristalsis of the small intestine, which decreases the time of exposure of the bots there to the lethal action of the drug. That *G. nasalis* is not essentially more resistant is evidenced by the experiments *in vitro* by Dove (1918) who found *G. intestinalis* to be the most resistant of the species of *Gastrophilus* to carbon bisulphid. It may be safely assumed in this connection that specimens of *G. haemorrhoidalis* which have passed to the large intestine, as they do in the spring, are likewise unaffected by the oral administration of carbon bisulphid by virtue of their location.

It may be noted in passing that Townsend (1918) has recently created the genus *Rhinogastrophilus* for the single-spined bot, *G. nasalis.*

SUMMARY.

The experimental evidence to date indicates that all bots present in the stomach and duodenum will be removed by the use of single doses of carbon bisulphid in amounts of 6 drams, or by two doses of 4 drams each with an interval of two hours, or by three doses of 3 drams each at 1-hour intervals, when given without purgation or with purgation at least several hours before or after treatment. The single does gives a smaller total of the drug and saves time. Repeated doses give an opportunity to suspend treatment, if bad results are evident after the first dose. In the interest of safety, these doses should not be exceeded.

Carbon bisulphid in doses of 4 or 5 drams will remove all the *G. intestinalis,* in their usual location in the cardiac stomach, but will leave some or all of the *G. nasalis.* The minimum effective doses for bots in general are, therefore, those stated in the preceding paragraph. In the interest of efficacy, the dosage given should be employed.

The use of linseed oil within a half hour of the administration of the carbon bisulphid will greatly diminish the efficacy of the drug against bots and against ascarids. Such use should, therefore, be avoided in the interest of efficacy. It seems to add nothing to the animal's safety and under certain conditions may cause superpurgation.

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HOW TO RAISE STANDARDS IN VETERINARY EDUCATION.

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(Continued from Page 139.)

III. d. OTHER ACTIVITIES OF THE COUNCIL ON MEDICAL EDUCATION.

The following extracts from the "Report of the Council on Medical Education of the American Medical Association," June 10, 1918, describing the scope of the Council's work, may well serve as guides to a future "Council on Veterinary Medical Education of the American Veterinary Medical Association":

"PRESENT SCOPE OF THE COUNCIL'S WORK.

During the fourteen years since the Council on Medical Education was established its work has developed and broadened under the direction of the secretary of the Council:

(*a*) Statistics are collected each year regarding the successes and failures of physicians at examinations conducted by state medical licensing boards. This material is tabulated and published in April each year in the State Board Number of *The Journal*.

(*b*) Statistics are collected each year in regard to medical colleges, students and graduates in the United States and Canada. These statistics are tabulated and published in August each year in the Educational Number of *The Journal*. Information also in regard to foreign medical colleges is being regularly obtained and kept on file.

(*c*) During the last five years the secretary of the Council has also had supervision of the American Medical Directory. This is a logical arrangement since so much of the data going into it is regularly obtained by the Council.

(*d*) The biographical index of physicians of the United States, which was begun with the publication of the American Medical Directory, is now under the direction of the secretary of the Council. Official information in regard to the graduation and licensing of each physician, which is regularly obtained, enables the Council to keep the biographical index of physicians up to date. This file now contains cards for 152,000 physicians of the United States and Canada.

(*e*) Since 1910 a register of medical students has been kept by the Council. This consists of an index showing full data regarding medical students from the time they enter the medical school. When the student has graduated, has obtained a license and has secured a location, his card is transferred to the biographical index of physicians. The information in this file is such that, should the records in any of the colleges be destroyed by fire or otherwise, the Council could replace the essential data regarding the students.

(*f*) The "Personal File" of information regarding physicians has thus far been kept up by various departments of the Association, but has always been an important adjunct to the biographic index of physicians. Recently, through the urging of the Federation of State Medical Boards, arrangements have been made to enlarge this file, so as to make the Council's headquarters a central bureau of information, especially in regard to illegal practitioners of medicine.

(*g*) The Council keeps in touch with all state licensing boards, noting changes in the personnel of those boards and in the requirements regulating the practice of medicine in the various states, particularly in regard to the educational standards enforced. At certain intervals information regarding the requirements to practice medicine in foreign countries is also obtained, through the American ambassadors or consuls in those countries. On the basis of this information a book of "Laws (Abstract) and Board Rulings Regulating the Practice of Medicine in the United States and Elsewhere" is compiled by the Council and published each year.

(*h*) Three tours of inspection of all the medical colleges in the United States have been completed, and of certain medical colleges six or more inspections have been made. Of the medical schools of Canada, two tours of inspection have been made. The classification of medical schools is published at frequent intervals in *The Journal of the American Medical Association* and in pamphlets. It is revised each year in accordance with changes made in the ratings of individual colleges.

(*i*) The Council conducts an annual conference on medical education and licensure. The conference has grown until it has drawn to it the annual meetings of other educational agencies, resulting in what might be termed an annual congress on medical education and licensure. This congress is now participated in by the Council, the Association of American Medical Colleges and the Federation of State Medical Boards of the United States. Other educational bodies are also holding meetings during the time of the conference. This annual conference has been the "open forum" where educational standards and other problems relating to medical education have been brought up for discussion. These conferences have resulted in securing united action by the various agencies interested in medical education, which accounts partly for the rapid progress since the Council was organized.

(*j*) From the beginning of this work the Council has carried on a campaign for higher standards of preliminary education, not only with medical colleges but also with state licensing boards.

(*k*) Since 1913, of the annual reports of the United States Bureau of Education, the chapter on medical education has, on request, been furnished by the secretary of the Council.

(*l*) The improvements resulting from the Council's work, through its conferences, its classifications of colleges and its campaign for standards of education, has made the Council an important factor in the standardization of high schools, and, more recently, of colleges of arts and sciences. Several years ago an effort was made to ascertain whether an education in an approved four-year high school was actually being required for admission by medical schools. More recently, under the increased entrance standard, it became equally essential to ascertain whether the medical school was actually requiring two years of work in an approved college of arts and sciences. In 1912 the

secretary of the Council collected the material for the preparation of a list of approved high schools, the list to include only those high schools which were accredited by the various state universities. It was found unnecessary to continue that work, however, since Dr. Kendric C. Babcock, then specialist in higher education of the United States Bureau of Education, consented to take it up. During the last two years the Council has compiled a list of approved colleges of arts and sciences, basing that approval on the list of colleges approved by standardizing agencies in whose methods the Council has confidence. This list by the Council may also be unnecessary at a later time when the Bureau of Education or other agencies shall be in position to compile such a list and keep it up to date.

(*m*) At the beginning of its work the Council published two standards, one for immediate adoption by the medical schools and state boards. The first was for immediate adoption and advocated a four-year high school education, a four-year medical course, and an examination for the license to practice. The second, then termed the "ideal" standard, advocated a year of preliminary collegiate preparation, including courses in physics, chemistry and biology, a four-year medical course and a year's internship in a hospital, preceding the examination for the license. This ideal standard has been exceeded in the matter of preliminary requirements, since two years of college work, instead of one, has proved to be the most satisfactory arrangement in this country. There remains the general adoption of the hospital intern year to entirely fulfill the requirements of the ideal standard suggested by the Council in 1905. Special effort in this direction is now being made. In 1914 a list of hospitals considered in position to furnish acceptable internships was prepared and published. During 1915 this list was carefully reviewed by state advisory committees and in 1916 a revised edition was published. At the annual meeting in 1917 the House of Delegates adopted the recommendations of the Reference Committee on Medical Education that $2,500 a year for three years be appropriated to further the work of investigating and standardizing hospitals. This increased appropriation has been granted by the board of trustees. The work will be advanced, therefore, definite standards will be fixed and a limited amount of hospital inspection will be done. In this work, the Council will coöperate with medical colleges, state licensing boards and other interested agencies.

(*n*) The Council has naturally kept itself fully informed regarding the various medical cults and has been in position to furnish reliable information in regard to them where such information was needed. Most of the cult schools have been inspected and first hand information regarding them is available, especially in regard to some of them which during the last year or so have received the legal right to grant M. D. degrees. On account of (*a*) the lack of, or exceedingly low entrance requirements; (*b*) the lack of teachers who have had a complete medical training; (*c*) the failure to study and recognize the various factors entering into the causation of diseases; (*d*) the resulting failure to ascertain the effective therapeutic measures which might be used, and (*e*) the lack of adequate laboratories, laboratory equipment, hospitals and clinical material—on account of all these deficiencies, no cult college could be considered as equal to the average medical college rated in Class C. The chief objection to the medical cult colleges has not been to the medical cults *per se*, but to their lack of, or seriously low, educational standards.

(*o*) The headquarters of the Council have, in fact, become a clearing house of information in regard to medical education, medical licensure, medical cults and other matters pertaining to these subjects. The Council has at its headquarters information which cannot be obtained in any other place. The use which state boards and others are making of this information has grown tremendously, as indicated by the voluminous correspondence that comes regularly to the headquarters of the Council. A tremendous amount of information goes also to prospective medical students and the demand for the pamphlet entitled "Making the Right Start," which was prepared especially for prospective medical students, has been constantly increasing. The volume of correspondence required to answer inquiries is already large and is steadily increasing. Much of the information is now regularly published in the *Monthly Bulletin* of the Federation of State Medical Boards, which goes to all members of all state boards.

The Council's Permanent Files.

The files of data at the headquarters of the Council are as follows:

(*a*) Announcements of medical schools of the United States. These files are being kept up to date and so far as possible back

numbers of the announcements of schools have been obtained. Catalogues of many of the foreign medical schools are also on file.

(*b*) Lists of medical graduates: This file consists of alumni lists, either in printed or card index form, which are complete for all schools existing as well as for the majority of schools which have become extinct. For the extinct schools our information is occasionally being added to and our files are gradually becoming more complete.

(*c*) Information in regard to foreign medical colleges, foreign graduates and the legal requirements for practice abroad.

(*d*) Biographical index of physicians of the United States and Canada. Every card shows the personal and educational history of each physician. Official data regarding the medical graduation and licensure of each physician is shown.

(*e*) Biographical card index of medical students enrolled in the medical colleges of the United States and Canada. Reports are received each year which keep this index up to date.

(*f*) Data obtained from the inspections of all medical colleges.

(*g*) Miscellaneous pamphlets bearing on medical education.

(*h*) Catalogues and other information in regard to medical cults. Much information has been obtained by actual inspection.

The Council's Work and the War.

As already stated, by the time this country entered the world war the reforms among medical colleges had made sufficient progress that for several years most of the medical graduates had benefited from the improved conditions in medical schools, such as the higher entrance requirements, the more skilled teachers, the better laboratories and laboratory equipment, the better clinical material and the greatly improved methods of medical teaching. It is the graduates of the last several years also, who, in largest proportions, have entered the government medical services. But the Council and the information it has collected have rendered other important services to the government, which are briefly enumerated as follows:

(*a*) When the selective service law was enacted, it made no provision for the exemption of medical students. In the Medical Students' Register, the Council had the home addresses of the majority of the students enrolled during 1916-1917, and was able by direct correspondence to secure reliable information

showing the proportion of students who would be taken by the draft. The data collected had much to do with the provision made later whereby drafted students were permitted to enter the enlisted reserve corps and to remain in the medical colleges until they should complete their medical training.

(*b*) Only such students were eligible for admission to the enlisted reserve corps as were enrolled in "well-recognized" medical colleges, which were defined as those recognized by the majority of state medical licensing boards. The only information immediately available by which it could be decided which colleges were so recognized, was Table D published last year in State Board Statistics (similar to Table 1 in this report) and which was based on reports signed by the various state board officers.

(*c*) The Council's files of information in regard to medical colleges were also placed at the disposal of the Surgeon-General, and the secretary of the Council has cooperated in inspecting and furnishing reports to the Surgeon-General regarding a number of medical schools.

(*d*) The biographical information in the files at the Council's headquarters has been used for the Surgeon-General in checking the qualifications of applicants for the medical reserve corps before commissions were granted. That information has also made possible the compilation and publication of the Honor Roll of Physicians in the campaign for the enlistment of additional medical officers.

(*e*) The Council's files of information in regard to standards of preliminary and medical education have likewise been utilized by the Surgeon-General's Office. This information included, also, a list of the approved colleges of arts and sciences and a list of hospitals considered in position to furnish acceptable internships, both of which lists were compiled by the Council.

In Conclusion.

The above outline of the Council's work shows the character of the information gathered and the great service it has rendered to the public, to the medical profession, and, more recently, to the government. Some idea, also, can be formed of the influence which, through its Council on Medical Education, the American Medical Association is wielding in the educational world. Through the work of the Council the medical profession is being

recreated by shutting off the supply from low grade colleges and increasing the output of high grade, well equipped colleges. Under the increased standards of preliminary education and the highly improved methods of teaching, the entire medical profession will be on a much higher plane of education, culture, training and technical skill than has ever before been true. This will place so wide a zone between the qualifications of physicians and those of followers of the various cults, that all laymen of average intelligence will be able to note the difference. Of more importance, however, because of this successful campaign for an improved medical education, the average physician will be able to render a far better service to the public and to the soldiers and sailors who are fighting with our allies in the world war.

Respectfully submitted.

Council on Medical Education,

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THE INFLUENCE OF THE ENDOCRINE GLANDS UPON THE ANIMAL BODY.*

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The body is managed by the endocrine glands contained therein. You have an automobile, and it is run by gasoline of one kind, in spite of the fact that it has a component mechanism, if you are short of gasoline or have a poor quality of gasoline. that invalidates the value of the automobile. But in the animal body there are many kinds of gasoline given off by many glands, each gland producing many secretions we do not as yet understand, but each gland and its special components has definite specific action, and every animal from the time it is born until the time it dies is under the influence of these many kinds of elements—some of them having to do with the development of the bones, some with the development of the teeth, some with the development of the body and later on with the development of the nervous system, and later, with the introduction of sex factors—with reproduction. Later in life these elements have to do with the preservation of these structures and functions which constitute the body; and if the gasoline element which is given off by these glands becomes under or over active there is a

* Read before Missouri Valley Association, July, 1919.

disturbance of the specific functions these component parts are supposed to perform, and as these glands are dependent upon each other the upset of one disturbs the rhythmic action of the others; so that an animal during its development and maturity keeps in action as its glands keep in normal action, and as it approaches the years of senility its glands change and its activity changes, so that if it lives long enough it is almost back to where the functions started in the early life.

We must not forget that the pituitary and thyroid have much to do with the development of the bones and the body, as may be seen from cretinism in the human family. The development of infantilism is traced in many cases to the lack of proper developmental stimuli by the thyroid or pituitary glands. The development of the status lymphatus shows the importance of the thymus and its associated lymphatic activities. The thymus is supposed to decrease at the time when the gonad functions develop. Hence among its functions are supposed to be that of inhibiting a too early development of the sex glands. Now there is a different development in the male than in the female, and that is explained by the fact that the secretions from the testes so act on the other glands of the body, especially the anterior pituitary and adrenal cortex, so as to increase their activity and give a heavier bony framework, larger head, larger feet, and a larger conformation generally; while the ovaries, not affecting the other glands to the same extent, are accompanied by a lesser stimulation of the anterior lobe of the pituitary and other glands controlling the development of the bones, and of the body, and the result is a smaller structure. Hence the difference in the male and the female conformation and disposition. The anterior lobe of the pituitary acts more specifically in the male than in the female; the posterior lobe acts more characteristically in the female than in the male.

Consider now the stage of puberty, the time when the female first comes into the period of œstrum. In the experience of many it has been noticed in some animals this period comes on early, while in others this period comes on late in life. In the early age of puberty the period of œstrum comes on at irregular intervals; at the same time in some of these young animals you will notice neurotic symptoms, which have up to this time been foreign to their disposition; they will develop habits at the time of œstrum which are vicious in character and the animal becomes

almost unmanageable. The anomalies of œstrum, these nervous symptoms, are due to the fact that the ovary is asserting itself as a new and powerful member of the endocrine family, upsets the other members and relationships, until finally, in the vast majority of cases, harmony is established. If harmony is established quickly, the period of œstrum comes regularly and there are no annoying symptoms. If harmony be established slowly and with difficulty you have more of the above named annoyances. If no permanent smooth action is established, you have a condition where every œstral period acts badly on the system.

Next is the stage of œstrum, a period in which the ovaries, pituitary, and thyroid are concerned. At every menstruation these three act or react, and according to the harmonious action of the three there will either be a normal or an irregular œstral period. The glands which preside especially over œstrum are the ovaries. Without ovaries no menstruation takes place. The ovaries are more or less under domination of other glands of the body. The thyroid has an important part in preserving and aiding the normal action of the ovary and uterus. The pituitary gland is intimately connected with the genital apparatus. At every œstral period the thyroid reacts to the menstrual stimuli and the posterior lobe of the pituitary undoubtedly plays its part. If the posterior lobe of the pituitary reacts excessively during the menstrual stimulus initiated by the ovary, then we find a long drawn out œstral period.

Why is pregnancy characterized by the absence of the œstral period? When the fecundated ovum settles in the intrauterine lining it nests and embeds in the decidua. As it grows, the outer layer of the ovum, which is called the trophoblast, invades the surrounding tissue and digests it by enzymic action. Cells from the trophoblast are given off immediately into the circulation, and this giving off continues as the ovum grows and the choronic villi develop and as the subsequent placenta comes into being. This secretion produced by the outer layer of the cells and the subsequent choronic villi and the subsequent placenta has the power to nullify the menstrual stimulus initiated by the ovary and aided by the thyroid and the pituitary. During the entire period of pregnancy, the ovaries, the thyroid, the pituitary, the adrenals, and other protective glands of the body are fighting against the secretion introduced by the growing ovum.

Pregnancy has a remarkable stimulating effect on many individuals; it is no infrequent thing to see an animal that is in an emaciated, depraved condition, fatten rapidly after conception; even the disposition is changed, the whole nervous system undergoes a change, the animal that was restless and unmanageable now becomes quiet and docile; in the young individual we see even a greater change during her first pregnancy—we see an increase in the size of bone; they grow, mature, and before the end of pregnancy they change from a spindling colt into a well-matured animal. Why is all this? What has brought about this wonderful change? The anterior pituitary, the adrenal cortex, and the thyroid are stimulated by the entrance into the endocrine family of a new secretion, the placental secretion which has stimulated the other members to greater activity.

What is parturition? Parturition is a crisis, and in that crisis certain glands—particularly the ovary, thyroid, and the pituitary, which normally are concerned in menstruation or œstrum, and which have been inhibited by the throphoblast and placental secretions—again come into action, with the result that on the three hundred and thirtieth day (in the mare) there is a menstruation which did not take place during the duration of pregnancy. Something occurs which brings ovary, thyroid, and pituitary back into their old function. The inhibiting element is gone. When we come to analyze parturition or labor we find it to be only a menstruation. The process of dilatation of the cervex, expulsion of the non-fecundated ovum, loss of blood, especially in the bitch, are miniature reproductions of the various processes which occur in parturition. Therefore we have pituitrin acting when the patient is in labor, whereas it does not act until the crisis occurs. If given when the patient is in labor it increases the pains, adds force, and its action is generally all that can be desired. Some inhibiting element has disappeared or some sensitizing element has come into being. If you give pituitrin before the animal is in labor, or before her expected time, it may bring on labor pains, but in a large majority of instances it has no further effect. Why does it act when given by hypodermic during labor or at the time when the patient is supposed to go in labor, and not at an earlier date? Because labor is a crisis, and you will find that pituitrin, given in proper doses and at proper intervals during labor, especially in the sow, when the fœtuses are so far within the cornua of the uterus

they cannot be reached with the forceps, that pituitrin given at this time will cause contractions which will produce results in many instances without further help. In the mare, especially if a primipara, and if the delivery be a normal one, and as in many cases uterine inertia develops, a few hypodermic injections of pituitrin will produce a normal partuition.

Let us now consider for a moment the question of abortion; not that of the infectious type, but the repeated, habitual kind with which we come in contact so often. In all these cases, where abortion occurs about the same time during pregnancy, if we could treat these patients and rely on the endocrine treatment, giving the individual trophic support which she needs and increasing the resistance to those factors which tend to produce abortion, we would be uniformly successful. What is the cause of these repeated abortions? The ovary, thyroid, and the pituitary, especially the pituitary, are trying each month to produce the œstral period; the placenta is trying for three hundred and thirty days to inhibit it. If the ovary, thyroid, and pituitary, especially the pituitary, are not too energetic the placental element nullifies this tendency, holds it up for three hundred and thirty days, until the parturition ensues at the regular time. If the placental element cannot inhibit this tendency, there is a menstruation, which is an abortion, early in pregnancy. So we should give to these patients the secretions which have a tonic influence and a trophic effect; we should never give pituitrin extract in any form, for fear of the too early evidence of the action of the gland.

THE PREPARATION AND DISTRIBUTION OF TUBERCULIN BY THE BUREAU OF ANIMAL INDUSTRY.*

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The eradication of tuberculosis in cattle would certainly be a hopeless task without the aid of tuberculin. In fact the tuberculin test is the very corner-stone upon which rests all of the vast undertaking which this conference is called to consider. Under these circumstances it is proper to give some consideration to the nature and methods of production of tuberculin.

* Presented at the Tuberculosis Eradication Conference of State and Federal Live Stock Sanitary Officials, held in Chicago on October 6 to 8, 1919, inclusive.

In the literature we may find described a great variety of tuberculins, most of which were originally produced for use in treating or diagnosing tuberculosis in man. In *veterinary medicine* three forms of tuberculin are usually recognized. They are known respectively as "subcutaneous," "intradermic," and "ophthalmic" tuberculin. All of these three forms of tuberculin are prepared from the concentrated tuberculin produced after the method described by Robert Koch in 1890. This is frequently referred to as "Koch's Old Tuberculin," "Old Tuberculin," "Concentrated Tuberculin," and also as "O. T.," meaning old tuberculin. A specific designation is necessary to distinguish this product from tuberculin produced in other ways, as well as from diluted forms of the "Old Tuberculin." The method of producing "Old Tuberculin" has remained practically unchanged since its introduction in 1890.

CULTURES USED IN MAKING TUBERCULIN.

Pure cultures of the bacillus of tuberculosis are required. Either the human or bovine type of bacillus may be used. (Tuberculin has also been prepared both from the avian bacilli and from bacilli obtained from cold-blooded animals, but such products are regarded as unsuitable for general practical use.) It seems to be well established that tuberculin prepared from the human type of bacilli is quite as reliable for diagnosing bovine tuberculosis as that prepared from the bovine type of bacilli. The human type grows upon artificial culture media far more readily and abundantly than the bovine type. For these reasons *the human type of bacillus*, that is, an organism obtained from a case of human tuberculosis and possessing the well known characteristics of the human type of bacillus, *is used generally if not universally* for the production of the tuberculin which is employed to detect tuberculosis in cattle.

The pure cultures are secured usually by inoculating guinea-pigs with sputum or diseased tissues from cases of human tuberculosis and the pure cultures of the tuberculosis bacilli are obtained from the tuberculous organs of the guinea-pig, by transferring bits of the infected tissue to tubes containing a medium suitable for the growth of the tubercle bacillus. Once a growth is well established outside of the animal body the micro-organism may be propagated with ease. Some cultures grow more luxuriantly than others. Those which grow rapidly and abundantly are best suited for the preparation of tuberculin. A good growing

culture of the tubercle bacillus having been obtained, the preparation of the tuberculin may be begun.

THE CULTURE MEDIUM AND THE PREPARATION OF OLD TUBERCULIN.

A clear broth is made from lean beef by extracting it with water. Peptone, glycerine and acid potassium phosphate, or sodium chloride are added in suitable proportions, and the broth is made about neutral to litmus by the use of sodium hydrate. Finally, after the broth is rendered perfectly clear by filtration, it is distributed in flat bottom flasks. The flasks of clear broth are then sterilized in an autoclave, after which they are ready for seeding with the tubercle bacilli. This is done in specially constructed, dust-proof and draft-proof rooms. A small flake of tubercle bacilli is transferred, from a young growing culture to the flask to be seeded, in such a manner as to cause it to float on the surface of the culture medium. The seeded flasks are then placed in an incubator which is kept at an even temperature of 100° F. The bacilli soon begin to grow and the pellicle on the surface will be seen to have increased perceptibly in size after a week. It then spreads rapidly over the entire surface of the culture medium, becoming finally wrinkled and opaque and of a faintly yellowish white color. These cultures, if conditions are favorable, are fully grown or "ripe," about 8 weeks after seeding and they are then used to make up the tuberculin.

The "ripe" cultures are heated in a steam sterilizer at 212° F. for 4 hours. This serves to kill all of the bacilli and at the same time to further extract from them the active principle of the tuberculin.

After the cultures are killed the entire contents of the flasks are poured into large open dishes which are heated on a steam bath until the volume is reduced to 1/10 of the original volume of the culture medium. This thick syrupy liquid is then filtered until clear and is finally sterilized.

This thick fluid thus obtained is the "Old Tuberculin" of Koch, or "O. T."

RATIO OF SURFACE OF CULTURE MEDIUM TO TOTAL VOLUME.

At this point I wish to call attention to a detail in growing cultures for tuberculin production. While this is a detail, it is of the greatest importance.

We have just seen that the amount of "Koch's old tuberculin" obtained from a given lot of cultures depends upon the amount of broth placed in the culture flasks, whereas the *strength* or *potency* of the tuberculin is derived exclusively from the bacilli that grows on the culture medium, and it must be clear also that the more the growth and the greater the number of bacilli on the surface medium the richer the tuberculin will be in the reactive principle.

With these two facts in mind, namely: 1st, *that the amount of tuberculin to be produced is dependent upon the culture medium,** and 2nd, *that the activity of the tuberculin is dependent upon the amount of growth of tubercle bacilli upon that medium,* it is clear that *tuberculin of the maximum potency can be produced only by securing a maximum of growth per unit of culture medium and uniformity in the strength* of the concentrated tuberculin can be obtained only by the *general adoption of means to secure this maximum growth per unit of culture medium.*

Now the tubercle bacillus grows only upon the *surface* of the culture medium, hence the amount of growth per unit volume of medium must within certain limits bear a very direct relation to the surface exposed for growth. Actual experiments have shown that this is true and it is for this reason that the Bureau's tuberculin is always produced from cultures in which the optimum surface area is exposed. It is our opinion that at least 5 sq. inches of surface should be provided for each 100 cubic centimeters of tuberculin.

Diagram 1 illustrates the effect that the surface area of the culture medium may have upon the potency of the tuberculin. Flasks *A* and *B* have the same surface area but flask *B* contains 30 times as much culture medium as flask *A*, hence 30 times as much tuberculin (O. T.) would be made from *B* as from *A*. It is equally evident that the tuberculin from *A* would be approximately 30 times as potent as that produced from *B*.

KINDS OF TUBERCULIN.

We have already seen that the three forms of tuberculin used in veterinary practice are derived from the concentrated "Old Tuberculin" of Koch. It remains to refer briefly to these three forms of tuberculin.

* This is merely an arbitrary rule first laid down by Koch and since universally followed.

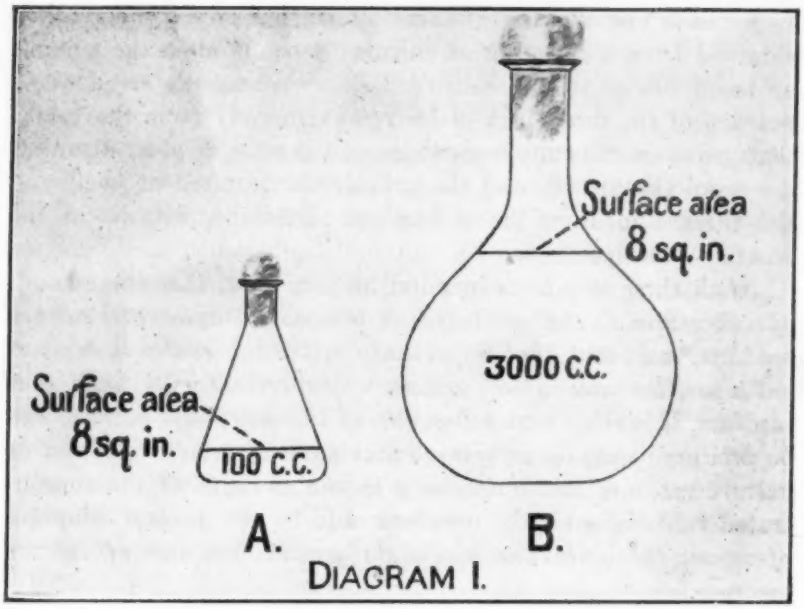

DIAGRAM I.

I. SUBCUTANEOUS TUBERCULIN.

The tuberculin used for subcutaneous injections is merely the old concentrated tuberculin, diluted with water containing about 0.5% of carbolic acid. The extent of this dilution is varied somewhat by different laboratories. Some even supply the tuberculin in the concentrated form, leaving it to the veterinarian to make the dilution. The subcutaneous tuberculin distributed by the Bureau of Animal Industry is diluted so that 4 cubic centimeters contain 0.5 gram of old tuberculin. Under the authority contained in the Virus-Serum-Toxin Act of 1913, the Bureau of Animal Industry requires that all establishments which manufacture or distribute tuberculin under a federal license shall show on their labels the amount of concentrated tuberculin (O. T.) contained in the solution that is sold. In the case of various drugs, as for example laudanum, tincture of Nux Vomica, and Fowler's Solution of Arsenic, the physician or the veterinarian is able to determine the proper dose because he knows the amount of the active substances, such as morphine, strychnine or arsenic that each contains. The specific substance that causes the tuberculin reaction has never been isolated, so we regard the concentrated tuberculin (O. T.) as the active substance and require that the amount of this in the various commercial preparations be shown on the label for the information of the vet-

erinarian. I think it should be emphasized that the veterinarian who is making tuberculin tests should think, when he is determining dosage, in terms of "Old Tuberculin" and not in cubic centimeters of the product he happens to be using.

II. Intradermal Tuberculin.

Comparatively little use has been made of the intradermal tuberculin test in the United States and the same is true of the ophthalmic test. The present great campaign against cattle tuberculosis has emphasized the need for all possible means for detecting diseased animals, hence the interest in these two tests is rapidly increasing.

Up to the present time no definite form or standard of strength for intradermal tuberculin have been recognized; experimenters in different parts of the world have used all kinds and dilutions of tuberculin for making the intradermal test. The practice of commercial houses in selling tuberculin for the intradermal test varies greatly. However, all forms are derived from the concentrated "O. T." The "O. T." has been used as such or diluted to ½, ¼ or 1/10 strength. At times the dry form of tuberculin is used in 5 or 10% solution. There is need for greater uniformity in the strength of intradermal tuberculin but this can be attained only by careful field investigations which should indicate the best concentration. There are indications that rather concentrated solutions are the most dependable. The Bureau does not now make a regular distribution of intradermal tuberculin. That which we have sent out for experimental use is equivalent in strength to a 50% solution of "O. T." The dose of this is from 0.1 c. c. to 0.2 c. c., which is equivalent to a dose of 0.05 gram to 0.1 gram "O. T." At times the subcutaneous tuberculin which the Bureau supplies has been used for intradermic testing and it has without question given good reactions in many cases just as very small doses of tuberculin given subcutaneously will reveal many cases of tuberculosis. Nevertheless we know that in subcutaneous testing some cases are missed if the dose is too small and the same is believed to be true of intradermal testing. The Bureau's subcutaneous tuberculin is not intended for intradermal use.

III. Ophthalmic Tuberculin.

Ophthalmic tuberculin, like intradermal tuberculin, is found in various forms. At times the concentrated O. T. is used but

more usually some of the so-called "purified" or "precipitated" tuberculins are chosen. The "precipitated" tuberculins of commerce are prepared by adding a given volume of Koch's old tuberculin to 10 or 20 volumes of 95% alcohol. The alcohol causes a precipitation of the active principle of the tuberculin, together with practically all of the inert substances which compose the broth upon which the bacilli are grown. This precipitation serves merely to separate the glycerine from the other constituents of the culture medium. The precipitate that is caused by the alcohol is dried and furnished to the trade in bottles usually accompanied by a separate bottle of sterile salt solution, which when added to the dry precipitate makes a five or ten per cent solution.

It appears that there is a need for determination of the most effective strength and the most suitable form for dispensing ophthalmic tuberculin. No doubt the variety of opinions as to the value of this test are in part at least due to the variety of tuberculins that are employed.

Irritating preservatives such as carbolic acid are never used in ophthalmic tuberculin.

In the Bureau's laboratories we have given considerable attention to the refining of Koch's old tuberculin and have succeeded in separating a precipitate of considerable potency and purity. This has been made into discs for the ophthalmic test. Each ½ grain disc contains approximately the equivalent of 0.1 gram (or 2 drops) of "O. T." In practice these discs are employed by inserting 1 into the conjunctival sac. This is for the purpose of sensitization. After an interval of from two to four days, one or two more discs are placed in the same eye. I believe these discs have given quite good results; in fact on the whole they seem to have given more satisfaction than any other form of ophthalmic tuberculin that the Bureau's inspectors have tried.

ACTIVE PRINCIPLE AND METHODS OF STANDARDIZATION.

Although the subject has engaged the attention of investigators in all parts of the world for years the exact nature of the substance in tuberculin that causes reactions in tuberculous animals is unknown. The most we can say is that it is probably a low form of proteid matter. This active substance is found in the broth on which the bacilli have grown and it may also be extracted from the bodies of the bacilli themselves.

Since we know so little of the exact nature of this active substance we nautrally are unable to measure with exactness the amount that is present in a given tuberculin.

The only method that serves to gauge even approximately the strength of tuberculin is based upon the fact that tuberculous guinea pigs are very susceptible to even small doses of tuberculin. A small dose causes their death within a few hours. In standardizing tuberculin by this method a large number of guinea pigs are infected with tuberculosis and after the disease has progressed to a certain point a number of the pigs are given graduated doses of a tuberculin of known potency and a similar number are given graduated doses of the tuberculin to be tested. In this way it is ascertained whether the sample to be tested will kill the tuberculous guinea pigs in as small dose as the standard sample.

This method is very difficult, cumbersome and costly. It is not used, so far as I am aware, by any producing laboratory in the United States.

The best assurance of a potent tuberculin is secured by using a vigorous culture propagated so as to secure the maximum growth, the greatest care being also given to sterilization, evaporation and final dilution.

DISTRIBUTION OF TUBERCULIN BY THE BUREAU OF ANIMAL INDUSTRY.

The Bureau of Animal Industry began the preparation of tuberculin in 1893, shortly after it was first used abroad to diagnose tuberculosis in cattle, and during all the years, down to the present time, has continued to supply tuberculin for official use to federal, state, county and municipal officers. The accompanying chart shows the amounts distributed yearly during the past 21 years.

As may be seen, the amount of tuberculin distributed has increased, especially during the last 4 years, while during the *last fiscal year* the increase has been as great as during the preceding 3 years combined. We distributed during the last fiscal year more than 2,300,000 c. c. of subcutaneous tuberculin besides considerable quantities of experimental ophthalmic and intradermic tuberculin. At the present time we are producing subcutaneous tuberculin at the rate of 6,900,000 c. c. per annum, or 3 times more than was distributed last year.

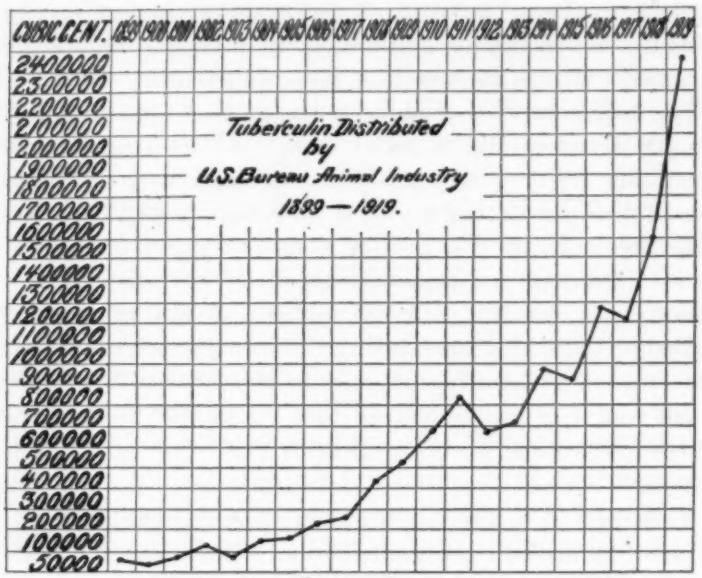

CHART I.

This means that it is necessary each working day to prepare broth and fill and sterilize 300 flasks of culture media. Each day 300 flasks must be seeded with tubercle bacilli or an average of 1 flask every minute and a half during each working day. We must keep growing in our incubators about 16,000 flasks of tubercle bacilli. We believe that the Bureau laboratories are now the largest producers of Bureau tuberculin in the world.

It is not within the scope of this paper to discuss the use or the effectiveness of tuberculin as a diagnostic agent but it may be noted that a recent survey of the records of 51,210 reacting cattle shows that visible lesions of tuberculosis were found in 49,414, almost exactly 96.5%. When we consider the difficulties which ordinarily surround the diagnosis of disease, this is a truly remarkable showing. Had it been possible to supplement the microscopic examination with laboratory studies even this high figure would certainly have been materially increased and we are justified in concluding that a reaction to tuberculin for all practical purposes means tuberculosis.

Last of all it is worth remembering that, as important as the standardization of the tuberculin undoubtedly is, there is another factor that should be standard also, and that is the inspector who makes the test. No matter how potent and reliable the

tuberculin is, the best result cannot be obtainable unless the tuberculin is applied with care and foresight nor unless the results of the test are given intelligent interpretation by experienced veterinarians.

THE PURIFICATION AND CONCENTRATION OF HOG CHOLERA SERUM.*

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The work discussed in this article was outlined and undertaken with the object of determining whether or not it was feasible from a practical, economic or commercial standpoint to subject anti-hog cholera serum to a refining and concentrating process analagous to that used in making the so-called globulin products from anti-diphtheritic and anti-tetanic sera for use in human medicine.

It was realized early in the work, in fact to some extent before operations were started, that any extremely elaborate or refined technique would be inapplicable to the object in view, so that nothing was undertaken but comparatively simple—in fact, almost crude—methods of precipitation with ammonium sulphate, solution of the precipitates obtained and filtration of the same.

The literature upon the subject of anti sera concentration and purification in general is very extensive and no attempt at its review will be made. It has to do mostly with products used largely in human medicine and, except as to the chemical processes involved, has little bearing on the subject under consideration. A few publications dealing with the concentration of anti-hog cholera serum have, however, appeared. Eberson[1] gives in considerable detail his work and results, which latter were quite successful from a scientific point of view, but shed little light on the practicability of his process for commercial quantities of serum—a feature which he expressly states he had not attempted to work out. Heinemann[2] merely mentions the fact that he had successfully concentrated the protective properties of anti-hog cholera serum into one third of the original bulk by a method he details in the same article. Reichel[3] reports the successful

* Results of studies conducted at the Nevada Agricultural Experiment Station under the Adams Fund as Project 17, beginning July 1, 1915. Publication authorized by the Director.

concentration of hog cholera serum, presumably in fairly large quantities, but gives little detail as to the process or the difficulties encountered. The diagram published, however, indicates a rather long and complex method of procedure hardly applicable to a process where low cost is absolutely essential.

SOURCE AND QUANTITY OF RAW MATERIAL.

As before stated, this work was planned for conduction on a scale such that the quantities of material processed would be sufficiently large for the results obtained to indicate the availability or otherwise of the process for commercial purposes.

The raw material used was all derived from twelve basic lots of hog blood totaling 68,175 mils. in amount, which were later subdivided more or less for variations of the refining and concentrating processes.

Of these twelve basic lots, one was ordinary hog cholera serum of the defibrinated whole blood type preserved with 0.5 per cent phenol in good condition; one was a lot of the same material which spoiled in storage due to the improper addition of preservative and which will be briefly discussed later. The other ten lots of material were freshly drawn blood, eight being taken from hyperimmune hogs and two collected at a packing plant for experimental work on technique only, no antibodies being considered.

PREPARATION OF RAW BLOOD FOR PRECIPITATION.

In view of the well established fact that the cellular elements of the blood of hogs hyperimmunized with hog cholera virus contain no antibodies, we considered it best to remove them before precipitation, carrying out the latter procedure on the clear serum or plasma only, the labor required for so doing being more than offset by the saving in amount of chemicals used for precipitation and the greater ease of carrying out the latter procedure with material free of hæmoglobin and cellular débris.

Ten of the twelve lots of raw material worked with being available as freshly drawn blood, several lines of procedure were tried to free it of fibrin and cellular elements before precipitating, as follows:

Two lots, consisting of the blood from twelve hyperimmune hogs totaling 16,180 grams in weight, were bled direct into 5,685 grams of 8 per cent sodium citrate solution, agitated and allowed to stand over night. So far as possible the supernatent fluid

was drawn off by syphon. The residue was then centrifuged and an additional amount of fluid secured which equaled about 40 per cent of the total recovered. The fluid plasma secured in this way contained a great deal of free hæmoglobin and as closely as it could be calculated represented in one instance 63 per cent and in the other 46 per cent of the volume of the whole blood—an average of only 54.5 per cent of actual serum recovery. While two trials are not sufficient to base a definite opinion upon, these results were taken to indicate that citration was not an efficient means of handling hog blood and other methods were adopted.

Four lots, representing the blood of 15 hyperimmune hogs totaling 21,385 mils., were prepared by bleeding into jars containing coiled wire, defibrinated by shaking, strained through gauze and treated by the method suggested by Dorset and Henley[4] for making clear raw serum as a finished product, 1 per cent of navy bean extract and 1 per cent of sodium chloride crystals being added to the defibrinated blood, after which it was centrifuged and the clear serum poured off. The serum recovery by this method was quite uniform and averaged 74.2 per cent of the volume of the defibrinated blood, the serum recovered being only slightly discolored with hemoglobin.

Four lots, representing the blood of 16 hogs and totaling 27,510 mils. of defibrinated blood, were prepared for precipitation by bleeding into jars containing coiled wire, defibrinating by shaking, straining through gauze and adding variable amounts of a saturated solution of sodium chloride, followed by centrifugation and the pouring off of the supernatent fluid.

The percentage of actual clear serum recovered by the sodium chloride alone method varied somewhat, the average for seven mixtures into which the four lots were subdivided for salting and centrifuging being 59.6 per cent. The maximum of efficiency by the sodium chloride alone process appeared to be reached by the addition of 10 per cent of a saturated solution of sodium chloride. Amounts in excess of this did not increase the percentage or quality of the serum recovered.

The clear serum obtained by either the navy bean extract or sodium chloride alone was apparently well suited to precipitation and a product nearly, but not quite, hemoglobin-free could be obtained by either method provided the defibrination, treatment and centrifuging were carried out with sufficient rapidity.

When the attempt was made, however, to pass the raw, clear serum derived as above through a bacteria-retaining filter, a marked difference was observed. Serum recovered by the use of navy bean extract and sodium chloride was difficult and for all practical purposes impossible of filtration, while serum recovered by the use of sodium chloride alone filtered much more readily, though even it presented rather more difficulty than the average run of horse sera. This difference in filterability did not appear to persist after precipitation and solution of the precipitates had been carried out, the finished product in that case being about equally difficult of filtration regardless of the method used for securing the original clear serum.

CHEMICAL PRECIPITATION.

It seems impracticable to give in one general, comprehensive statement the results obtained by and the difficulties encountered during this manipulation, so that an attempt will be made to discuss the various features involved under more or less separate headings, illustrating each point with examples from the working sheets of individual lots.

General Method.

Keeping constantly in mind the fact that to have any practical value this process must be simple and free from too elaborate technique, the following general line of procedure was adopted:

The plasma obtained by one of the methods discussed above was diluted with distilled water until the mixture contained approximately 6 per cent protein. It was then brought to the desired strength of ammonium sulphate by adding a saturated solution of the latter in the required amount, after which the mixture was heated in a water bath for 1 hour, starting at about 55° C. and finishing at 59-60° C., and placed on filter papers to drain. The precipitate was washed with a moderate amount of ammonium sulphate solution of equivalent strength, and such washings gathered as part of the filtrate. Saturated solution of ammonium sulphate was then added to the filtrate in proper amount to bring it up to the required percentage content and the precipitate so formed again collected on filter papers, this process being repeated until the desired number of fractional precipitates was obtained.

The precipitates secured in this way were then brought into solution and tested for potency on test animals against hog

cholera virus. Neither solution and reprecipitation of the original precipitates was resorted to nor any further purification process beyond the rinsing with ammonium sulphate solution described.

All the fractional precipitates discussed in the next section were obtained by the general plan above. Later, after the range of precipitation was apparently established, a single precipitation was carried out. For this purpose we used a modification of the method proposed by Homer[5], which was briefly as follows:

The clear serum was diluted with approximately one half its volume of filtered water and this mixture brought to 55 per cent saturation by adding saturated solution of ammonium sulphate in proper amount. There was then added an amount of sodium chloride crystals sufficient to bring the whole mixture up to 2 per cent sodium chloride, allowance being made for that added to the original defibrinated blood during the removal of the corpuscles. This finished mixture was then heated gradually in a water bath for two hours, starting at room temperature and finishing at 59-60° C., gentle stirring being kept up during the heating process.

The precipitate so obtained was gathered on hard filter papers readily, complete drainage being obtained in 24-36 hours, and the precipitate so gathered being a whitish, fine, homogeneous mass. Practically all of any hemoglobin present in the plasma processed passed on in the filtrate. The precipitate so obtained, after being freed from all excess moisture by pressure between pads of bibulous paper, was readily soluble in normal saline solution or water containing phenol for preservative purposes.

Potency of Fractional Precipitates.

In all, nine lots of highly potent serum were subjected to fractional precipitation with varying percentages of ammonium sulphate and, disregarding certain lots in which the results were not satisfactory from a technical point of view, our results confirmed the findings of Eberson[1] to the effect that the antibodies were contained in both the pseudo and euglobulin fractions and could only be entirely recovered by a saturation up to approximately 55-60 per cent of ammonium sulphate.

The following table showing the results of potency tests on the various fractional precipitates from a single lot of serum is quite typical of the general results obtained after the technique was reasonably well perfected.

TABLE No. 1.

Showing Results of Potency Tests on Original Clear Serum, Lot No. 9, and Three Fractional Progressive Precipitates From Same.

Hog No.	Wt.	Material Injected	Dose in Mils.	Rate per lb. in Mils.	RESULT
1	83	Original clear serum*	18	.2	Lived
2	67	Original clear serum	14	.2	Lived
3	61	Original clear serum	18	.3	Lived
4	76	Original clear serum	23	.3	Lived
5	66	Original clear serum	26	.4	Lived
6	57	Original clear serum	23	.4	Lived
7	74	0-30% fractional precipitate	15†	.2†	Died, hog cholera, 17 days
8	66	0-30% fractional precipitate	13	.2	Lived
9	55	0-30% fractional precipitate	17	.3	Lived
10	74	0-30% fractional precipitate	22	.3	Lived
11	66	0-30% fractional precipitate	26	.4	Lived
12	55	0-30% fractional precipitate	22	.4	Lived
13	73	31-50% fractional precipitate	15	.2	Lived
14	62	31-50% fractional precipitate	13	.2	Lived
15	53	31-50% fractional precipitate	16	.3	Died, hog cholera, 13 days
16	71	31-50% fractional precipitate	21	.3	Lived
17	61	31-50% fractional precipitate	25	.4	Lived
18	53	31-50% fractional precipitate	21	.4	Died, hog cholera, 15 days
19	70	51-70% fractional precipitate	42	.6	Died, hog cholera, 24 days
20	61	51-70% fractional precipitate	49	.8	Died, hog cholera, 18 days
21	45	51-70% fractional precipitate	45	1.0	Died, hog cholera, 20 days
22	90	Controls received virus only	C	C	Died, hog cholera, 13 days
23	84	Controls received virus only	C	C	Died, hog cholera, 13 days
24	43	Controls received virus only	C	C	Died, hog cholera, 15 days
25	35	Controls received virus only	C	C	Died, hog cholera, 19 days

All hogs received 2 mils. of standard hog cholera virus.

*Prepared from mechanically defibrinated blood by addition of 1 per cent navy bean extract and 1 per cent sodium chloride, followed by centrifugation. Actual serum recovered, 77 per cent, by volume, of defibrinated blood; 10 per cent of a 5 per cent solution of phenol added as a preservative.

†In case of groups receiving fractional precipitates, dose and rate per pound are based on amount of original clear serum from which fractional precipitate was derived.

These and similar results seemed to indicate quite clearly that the 0-30 and 31-50 fractions possessed great protective powers against hog cholera virus (though by no means all of the antibodies were contained in either of them), but that the 51-70 fraction was nearly, but not quite, inert; and that by a single precipitation by saturation up to 55 per cent ammonium sulphate practically all the antibodies in the serum could be recovered—a deduction which appeared to be borne out by later work.

In all, five lots of potent serum were submitted to a single 55 per cent precipitation and the precipitates tested for potency. The table below is a fair example of the results obtained by such potency tests, which were remarkably uniform.

TABLE No. 2.

Showing Results of Simultaneous Potency Tests on Original Clear Serum and Two Single 55 per cent Precipitates, Nos. 10 and 11, Derived from It.

Hog No.	Wt.	Material Injected	Dose in Mils.	Rate per lb. in Mils.	RESULT
1	84	Original clear serum*	34	.4	Lived
2	65	Original clear serum	26	.4	Lived
3	80	Original clear serum	24	.3	Lived
4	62	Original clear serum	19	.3	Lived
5	74	Original clear serum	16	.2	Lived
6	59	Original clear serum	12	.2	Lived
7	71	Original clear serum	8	.1	Lived
8	56	Original clear serum	6	.1	Lived
9	81	Single 55% precipitate, Lot 10	32†	.4†	Lived
10	63	Single 55% precipitate, Lot 10	26	.4	Lived
11	75	Single 55% precipitate, Lot 10	24	.3	Lived
12	61	Single 55% precipitate, Lot 10	18	.3	Lived
13	71	Single 55% precipitate, Lot 10	14	.2	Lived
14	56	Single 55% precipitate, Lot 10	12	.2	Lived
15	67	Single 55% precipitate, Lot 10	8	.1	Lived
16	53	Single 55% precipitate, Lot 10	6	.1	Lived
17	82	Single 55% precipitate, Lot 11	32	.4	Lived
18	64	Single 55% precipitate, Lot 11	26	.4	Lived
19	80	Single 55% precipitate, Lot 11	24	.3	Lived
20	62	Single 55% precipitate, Lot 11	18	.3	Lived
21	73	Single 55% precipitate, Lot 11	14	.2	Lived
22	57	Single 55% precipitate, Lot 11	12	.2	Lived
23	68	Single 55% precipitate, Lot 11	8	.1	Lived
24	54	Single 55% precipitate, Lot 11	6	.1	Lived
25	36	Controls received virus only	C	C	Died, hog cholera, 24 days
26	39	Controls received virus only	C	C	Died, hog cholera, 19 days
27	47	Controls received virus only	C	C	Died, hog cholera, 11 days
28	92	Controls received virus only	C	C	Died, hog cholera, 11 days

All hogs received 2 mils. of standard hog cholera virus.

*Prepared from mechanically defibrinated blood by addition of 1 per cent navy bean extract and 1 per cent sodium chloride, followed by centrifugation. Actual serum recovered 72 per cent, by volume, of defibrinated blood; 10 per cent of a 5 per cent phenol solution was added as a preservative.

†In case of groups receiving precipitates, dose and rate per lb. are based upon amount of clear serum from which precipitate was derived.

In view of the fact that the doses in these tests still protected, although carried down very low, it seemed quite conclusively

proven that practically all the antibodies present in the original serum must have been recovered by the single precipitation.

Reprecipitation.

In one instance a mixture made up of twenty-one different precipitates of various percentage fractions and one lot of clear serum was made and the whole mixture precipitated by the addition of 55 per cent of ammonium sulphate. The resulting precipitate was then brought into solution and tested for potency. As nearly as could be calculated in the case of such a complicated mixture, the final product contained nearly all the protective properties present in the serum from which the various portions of the mixture were originally derived. It is interesting to note, however, that this reprecipitation and solution did not appear to make the final product any more readily filterable. The general difficulties in connection with this problem will be discussed later.

Dialysis of Precipitates.

No extensive work was done along the lines of dialysis of precipitates, market conditions being such that the obtaining of a supply of suitable paper was apparently impossible at the time this work was being carried on. Enough work was done, however, to indicate that these precipitates could be rendered ammonium sulphate-free by dialysis without material loss of antibodies.

It was also found by experience that solutions made up from precipitates from which the free fluid had been removed by pressure between absorbent pads did not contain enough ammonium sulphate or sodium chloride to produce any local or general disturbance when administered to swine subcutaneously or intramuscularly; so that no material advantage was to be gained by dialysis.

Concentration and Filterability of Finished Product.

The two outstanding advantages which might be obtained by a process such as we have discussed would apparently be a concentrated product admitting of small dosage and complete sterilization and clarification. Our experiments, however, did not yield much encouragement as to the possibility of a combination of these two features.

Great concentration of finished product as compared to the original serum is perfectly feasible. The precipitates obtained

by a single precipitation with 55 per cent of ammonium sulphate can be readily brought into what appears to be complete solution in normal saline solution or distilled water, so that the solution is only one fourth the volume of the original serum.

Once passed through a bacteria-retaining filter, the final product is a beautiful, clear, palely opalescent fluid, with no marked tendency to deteriorate by clouding or precipitation during storage, and apparently fully potent. However, the large mass of precipitate resulting from the addition of the 55 per cent of ammonium sulphate required to insure the gathering of all the antibodies in a single precipitation, even when dissolved in a volume of water or normal saline solution equal to the original serum, produces an extremely viscid, opaque, gray liquid. Even after centrifugation or several passages through paper or asbestos filters, the passage of this liquid through a bacteria-retaining filter candle was not possible in practical amounts, the filter-choking substance evidently being in true solution or so finely suspended as not to be removable by such preliminary treatment.

No attempt at chemical clarification of the final solutions before filtration was made, and there may still be possibilities along this line, or perhaps some modification or refinement of the precipitation method might overcome the difficulties of final filtration.

Reichel's[3] report, in fact, indicates that with the somewhat more elaborate methods of precipitation used by him, passage of the finished product through bacteria-retaining filters presented no great difficulty.

An interesting circumstance was noted in connection with the practical failure of the final filtrations—namely, that cultural tests showed many of the solutions to be sterile in spite of the fact that no precautions in excess of what might be considered ordinary household cleanliness had been taken at any time during the process against contamination, a final filtration having been counted on for sterilization. This indicated that the final precipitate solutions with the usual preservative added had marked bactericidal powers tending to self-sterilization. Such solutions, however, when actually planted with a culture of B. subtilis rich in spores yielding a luxuriant growth after six months, even though phenol was present in excess of 1 per cent, thus showing that self-sterilization of these solutions could not

be relied upon in actual practice where they were exposed to general contamination.

THE UTILIZATION OF DEFECTIVE SERUM.

In certain circumstances the use of the simple method described—namely, a single precipitation with 55 per cent of ammonium sulphate and the solution of the resulting precipitate—might be of value in utilizing defective anti-hog cholera serum. The great reduction in bulk possible by this method might permit of the utilization of antiserum of low potency but in good physical condition, though the expense involved for chemicals and labor would probably be as great as that for the production of an equal number of protective units in additional lots of serum.

The persistent production, however, of serum of low potency in spite of every effort to the contrary is not now a factor encountered in the production of anti-hog cholera serum, as it still is in the case of some other antisera where the horse is used as the producing animal, especially with antigens not actually pathogenic for equines in the true sense of the word.

We made one unsuccessful effort to salvage a lot of ordinary defibrinated whole blood hog cholera serum which was highly potent at the time of production, but on removal from cold storage four months later was found spoiled, some stock bottles being badly decomposed and others solidly coagulated. The trouble had arisen from insufficient agitation at the time the preservative was added to the whole lot in bulk before placing in stock bottles.

This solid and liquid material was emulsified, strained, the solid residue leached with water and again strained, and this process repeated several times until nearly the whole was brought into a bulky, watery solution which was precipitated by the addition of 55 per cent of ammonium sulphate, a precipitate of satisfactory bulk and consistency being obtained. This precipitate, however, when tested for potency against hog cholera virus showed very little protective value compared to that present in the original serum represented. It is presumed that the antibodies were either destroyed by decomposition or so entangled in the solid residues as not to be removed by the leaching process, or both.

PRACTICAL VALUE OF THE PROCESS.

There would seem to be several very good reasons why anti-hog cholera globulins prepared along the general lines described

in this paper are of little practical value for actual use in the control of hog cholera. These reasons will be briefly mentioned.

Owing to the generally low unit value of swine, any product used to protect them against hog cholera must be relatively inexpensive; and while no attempt has been made to keep detailed cost records during this work it is obvious that the outlay for chemicals, apparatus, fuel and labor needed to carry out a process of this sort is quite heavy.

An actual demand for such a refined product probably does not exist, as the simple, clear anti-hog cholera serum which would be the raw material used in this process is itself an almost perfect agent of its kind. The relatively large dose used is no real drawback, owing to the fact that it is derived from and used entirely upon swine and is therefore a strictly homologous serum not capable of producing any objectionable phenomena such as anaphylactic shock, serum sickness, etc. At the present time clear, sterile anti-hog cholera serum is being produced commercially and sold at a price little, if any, in excess of that charged for the old type of defibrinated blood hog cholera serum and appears to be successfully meeting all requirements for the economical control of hog cholera; so that no increase in the cost of such work is warranted.

CONCLUSIONS.

1. The recovery of practically the entire antibody content of anti-hog cholera serum in a single precipitation by the addition of 55 per cent of ammonium sulphate is apparently uniformly accomplished.

2. The subsequent final clarification and sterilization of such precipitates in solution by passage through a bacteria-retaining filter is exceedingly difficult and perhaps impracticable, though the anti-body content is not apparently lowered by such filtration when it is accomplished.

3. The commercial production of such a globulin product is probably not justified at this time owing to the high cost as compared to the very satisfactory sterile, clear anti-hog cholera serum now on the market at a reasonable price.

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FEDERAL MEAT INSPECTION AS A SAFEGUARD TO PUBLIC HEALTH.*

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It is common knowledge that the Federal Government maintains, through the Bureau of Animal Industry of the United States Department of Agriculture, a system of meat inspection, but comparatively few persons are familiar with its scope or the manner in which it protects public health. The work is scientific and technical and gives consumers comfortable assurance that the inspected products they buy are healthful and wholesome. The inspection proceeds by logical steps, commencing with the careful ante-mortem examination of the animal, continuing with the inspection of the carcass while being dressed, the supervision of all meats, used for curing, pickling, smoking, cooking, or canning, and finally with the proper, honest labeling of all meat or meat products.

MORE THAN SEVENTY MILLION ANIMALS INSPECTED LAST YEAR.

The extent of the Federal meat inspection service is definitely shown by the number of cattle, sheep, goats and swine slaughtered under Federal inspection. For a number of years the totals have approached 60,000,000 annually, or nearly two-thirds of all such animals slaughtered for food in the United States in the same periods. Figures for the fiscal year ending June 30, 1919, show a remarkable increase over previous years. Altogether more than 70,000,000 animals were slaughtered under Federal inspection. This inspection included in round numbers: Cattle, 11,241,000; calves 3,674,000; sheep 11,268,000 goats 125,000;

* Presented at meeting of American Public Health Association, New Orleans, October 30, 1919.

and swine 44,398,000. The statement that so many animals were inspected means that all were examined while alive and that the organs and different parts of each animal were inspected at the time of slaughter to determine their fitness for food. However, this double inspection, complete and important as it is, is but the first of several steps in the Federal system. The subsequent handlings—processing, preparation, storage and labeling—are given supervision, and the meats are reinspected as often as may be necessary. The federal system has been aptly described as extending "from the hoof to the can" or "from the live stock pen to the finished meat or product in the labeled package ready for shipment to the consumer."

WIDE RANGE IN INSPECTORS' DUTIES.

The scope and purpose of federal meat inspection are to place the federal mark of approval upon all meats and products which competent examination shows to be sound, healthful and fit for food, and to condemn and destroy those which are found to be dangerous, unsound or otherwise unfit for such use. The inspection also includes supervision of the establishments with respect to sanitation, construction, and suitable methods of handling all meat and their products. Furthermore, the consumer of meats is protected against the use of harmful dyes and chemicals, and against false or misleading names or statements on labels. In short, the meat inspection service seeks to protect the public health and the rights of consumers, and to do this without infringing upon the just rights of the producer, and without waste of the nation's meat-food supply.

Federal meat inspection is being maintained at 825 establishments in 230 cities. These figures undergo some increase or decrease from time to time, but they represent a reasonably permanent average. Stated in round numbers about 2,600 inspectors are regularly employed. Of this number about 800 are graduate veterinarians; the remainder are lay inspectors, who, through experience and training, acquire the technical knowledge and skill necessary to a proper performance of their duties. The appointing of inspectors is controlled by and is in accordance with the requirements of the United States Civil Service Commission.

Sometimes the question is asked why federal meat inspection is not made to cover every slaughter house and meat-preparing

plant in the United States instead of a limited number. The answer is that the Federal Meat Inspection Act is based on the commerce clause of the constitution, which restricts the application of federal inspection to establishments engaged in interstate or foreign trade and to meats and products which are to be sold or shipped as articles of interstate or foreign commerce. The inspection cannot be extended to those establishments which confine their sales and shipments to the state in which located. However, when federal inspection is inaugurated at an establishment it is maintained there in respect to the whole establishment and applies to all animals slaughtered, and to all products prepared therein. This is necessary to the completeness of the inspection and to a proper enforcement of the regulations. The result is that very great amounts of meats not shipped or sold in either interstate or foreign commerce, but consumed locally, are, nevertheless, inspected and bear the marks of federal inspection.

The inspection has been extended as far as contemplated and permitted by the law and as far as has been possible with the funds provided by Congress for its maintenance. If the entire meat food supply of the country is to be properly inspected, it will devolve upon the several states or municipalities to establish and maintain an adequate inspection to cover the field to which federal inspection cannot be extended. Many of our cities do maintain such an inspection.

The great need of an efficient meat inspection is shown by the number of animals and the quantities of meats and products which are condemned yearly on account of disease, unsoundness, or other condition of unfitness, and thereby excluded from the food supply. The complete figures for all classes of animals and the various reasons for condemnation involve considerable detail. However, a general statement regarding them should serve the present purpose. For instance, on the post-mortem inspection alone there was condemned in the fiscal year 1919 a total of 212,245 cattle, sheep, swine and goats; while organs and parts of carcasses condemned on account of localized disease run into the hundreds of thousands.

TUBERCULOSIS AND HOG CHOLERA CAUSE MOST CONDEMNATIONS.

Tuberculosis in cattle and tuberculosis and cholera in swine were responsible for more condemnations than all other diseases

and causes combined. In addition to the condemnations on the post-mortem inspection, it was necessary to condemn in that year a total of more than 17,000,000 pounds of meats and products on account of their having become tainted, rancid, unclean, or otherwise unwholesome in the course of shipment, processing, preparation, or storage. The condemnations aggregate an enormous amount of material; fortunately, however, it represents but a relatively small part of the total of animals and meats inspected. By some the condemnations might be regarded as evidence that disease prevails to an unusual degree in American live stock, or that on account of undue strictness the inspection is wasteful of potentially good food. Neither of these deductions is in accord with the facts. Disease is less prevalent in the live stock of the United States than in the various European countries. As regards the inspection it must be maintained in the interest of the public health with a due measure of strictness. Necessarily this entails loss, but such loss can not be called waste. Moreover, the basic rules and regulations by which condemnations on the post-mortem inspection are determined were prepared with great care by competent officials, and then were submitted to an independent committee, composed of scientists and hygienists of the highest reputation, for consideration, and received that committee's approval.

INSPECTION BEFORE SLAUGHTER.

The first examination is the ante-mortem inspection, or inspection of the animals prior to slaughter. They are scrutinized while at rest in the pens or as they are moved from the scales. If the condition of an animal is such as to cause the inspector to suspect that it is diseased or affected by any condition which will cause its condemnation in whole or in part on the post-mortem inspection, the animal is set apart and marked "U. S. Suspect" by means of a serially numbered metal tag affixed to the ear. Such animals are held for separate slaughter and for an especially careful post-mortem examination. The diseases and conditions for which animals are most frequently so tagged are cholera, actinomycosis, emaciation, advanced pregnancy, and severe or excessive injuries. Animals which show symptoms of rabies, tetanus, milk fever, railroad sickness, and hogs which manifestly are sick with cholera are condemned and their carcasses destroyed without admission to the slaughter room. Such animals are

marked by the inspector with a numbered metal tag bearing the legend "U. S. Condemned."

POST-MORTEM INSPECTION INCLUDES EXAMINATION OF ORGANS.

The post-mortem or slaughter inspection is the most important of the several inspection procedures because it affords greater opportunity to discover the existence of most diseases. This calls for careful examination throughout. Accordingly, the inspectors first examine those glands, organs or parts in which disease most frequently occurs. For instance, in both hogs and cattle certain of the lymph glands of the neck usually are the first to show evidence of tuberculosis; therefore, those glands in every animal are cut and carefully viewed. The cheek and heart muscles of cattle are the seats where the beef measle, which produces tape worm in man, first appears. Accordingly, these parts are sliced in every instance so that no cow or steer affected with measles shall escape. These particular procedures are cited simply to indicate the pains taken to make the post-mortem inspection a thorough one. All the organs, as well as the carcass, are covered by this examination. If, on the completion of this inspection, the meat is found to be sound and fit for food the carcass is passed, and marked "U. S. Inspected and Passed" with the official number of the establishment at which it was slaughtered. The brand used for thus marking the carcasses is circular with the above legend in abbreviated form, and is stamped with a purple ink on the principal parts of the carcass. The ink is absolutely harmless.

ALL CONDEMNED MEAT DESTROYED IN GOVERNMENT-SEALED TANKS.

If an animal is affected with disease or other objectionable condition, whether it be slight, extensive, local or general, the inspectors mark it with a serially numbered U. S. Retained tag. Carcasses and parts so marked are officially in the custody of the inspector and are transferred to what is designated the final inspection room or place, where all the facilities necessary for the thorough examination of such carcasses are provided. The final inspection and disposition of retained carcasses and parts is a very important duty; therefore, only those veterinary inspectors who are the most experienced in the work are assigned to its performance. If the final inspection shows the meat to be

unfit for food, the carcass and the parts are condemned and plainly marked "U. S. Condemned" by means of a large metal brand. All condemned meats and products remain in the custody of the inspectors and are destroyed under Bureau supervision by conversion into fertilizer and grease in government-sealed rendering tanks. If the condition for which the carcass is condemned is found to be local the affected parts are condemned and the remainder of the carcass is passed.

LABELS MUST BE APPROVED.

The products inspection, as it is termed, covers the inspection and reinspection of meats and products from the time of slaughter through the succeeding processes of preparation and storage, including supervision of all operations to insure the sanitary handling of all edible materials. This supervision also controls the addition of spices, curing agents and other ingredients to products. None but those permitted under the regulations may be added. In order to see that the regulations are strictly observed a system of frequently collecting samples without notification to the establishment for laboratory examination is maintained. The products inspection also includes supervision of the branding and labeling of meats and products. The use of labels bearing false or misleading names or statements is prohibited; in fact, only those labels which have first been submitted to the Bureau and approved by it, may be used. The contents of the package must conform to the statements on the label.

The sanitary requirements prescribed and enforced under the meat inspection regulations constitute a highly important part of the federal system. The Meat Inspection Act confers upon the Secretary of Agriculture authority to prescribe and enforce such regulations at all establishments at which inspection is maintained. The more important of these requirements are adequate and proper toilet and lavatory and dressing room accommodations, and also smooth and impervious surfaces for operating rooms and equipment. Other requirements include good light, adequate ventilation, modern plumbing, efficient drainage, complete separation of rooms in which edible products are prepared from those in which inedible materials are handled, and pure water with ample facilities for its distribution. The requirements enumerated indicate the character of the sanitary regulations. Their purpose is to insure strict cleanliness in the preparation and handling of meats and meat food products, and

for the maintenance of clean and wholesome conditions in and about the establishment. Since the present meat inspection act became effective the establishments in the United States at which federal meat inspection is maintained have expended in the aggregate many millions of dollars in order to conform to the standard set by the regulations. It has been money well spent. The difference between a modern, sanitary plant operating under inspection and the country type of slaughter house operating without inspection of any kind is too marked for description. It needs to be seen to be adequately and properly appreciated. The regulations governing sanitation were framed on progressive lines, so that they not only serve the present needs, but also provide for the attainment of still better standards for the future. When new plants are to be erected or old ones reconstructed it is aimed to have the best standards followed; accordingly, it is required that the plans and specifications for the same be submitted to the Bureau for examination and approval.

IMPORTANT FACTOR IN FOREIGN TRADE.

While federal meat inspection is primarily a service in hygiene and sanitation, it occupies, nevertheless, an important position in our trade economics, and is the agency through which a very important part of our export commerce has been maintained. Without its certificate of inspection, the export trade in meats and meat food products would be seriously impaired. The amount of beef, pork and mutton certified for export in the fiscal year 1918 exceeded a total of 2,500,000,000 pounds, while the certification for the fiscal year 1919 will approximate 3,400,000,000 pounds. The figures do not include the shipments made to the American expeditionary forces in France. Exports have been tremendously stimulated by the war. However, under normal conditions the United States imports as well as exports great quantities of meats. All the imported meats are subjected to an adequate inspection under the federal system.

An economic importance possessed by federal meat inspection, but to which only casual reference can be made at this time, is the relation of its post-mortem records to the locating of territories in which food animal diseases prevail to an unusual extent, and the eradication of which is to be attempted.

A further point in regard to the economic value of federal meat inspection is the moderate cost at which it is maintained. The first aim is to make the service efficiently fulfill the purpose

for which it is intended; the second, to administer it with due regard to economy. In computing unit cost of maintenance the federal system has the advantage of a very large volume of operations, and it will be gratifying to the tax-payer to learn that largely owing to this advantage the service is maintained at a cost of less than six cents for each animal inspected. This sum covers the expense of all the inspections from that of the live animal to the final examination of the finished products.

STUDY OF LOCAL INSPECTION.

Lately the Bureau has completed a survery of municipal and state meat inspection. About one-third of the meat consumed in the United States is slaughtered and sold within state boundaries and therefore is not subject to federal inspection. This is a condition which local authorities must handle. The results of the survey include some highly interesting facts and figures, and to make them available to members of the Association I have requested our Mr. Roberts to furnish the Association with a copy of the findings. You will learn that the majority of cities have no inspection of their meats. The reasons for the absence of local supervision in many cities include lack of funds and lack of sufficient interest. Apparently health considerations alone have failed to rouse cities to the importance of having local meat establishments inspected. It is not within my authority to say what should be done, but this much is certain, the inspection is needed as the facts show and as all who are familiar with average slaughter house conditions will quickly admit. Their interest in health alone fails to get results, possibly some additional fact may be found and used as means of obtaining and holding the necessary support.

Municipal and state meat inspection is a field where a great deal of constructive work remains to be done. It is paramount for health reasons and the health side appeals to many people. Yet the economic side may appeal to a great many more. This, briefly, is the thought I want to leave with you. Human welfare is the common cause we are serving. Methods of livelihood have produced what are commonly called "industrial classes" and also terms like "product," "consumer," and "distributor." Each group has its problems in which it is deeply interested and many of which are vital to human happiness. In attempting to carry certain lines of scientific work before the public we may

wisely study the aims of these groups, thus meeting with co-operation which may simplify many a knotty problem and hasten the successful solution of others.

STUDIES ON ANTHELMINTICS.

VI. TESTS OF THE ADMINISTRATION OF ANTHELMINTICS IN ENTERIC-COATED SOFT GELATINE (SOLUBLE ELASTIC) CAPSULES.

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Anthelmintics intended to remove worms from the small intestine must first pass the stomach, and we know that a certain amount of the anthelmintic is absorbed by the stomach, thereby adding to the systemic toxic effects, in addition to diminishing the amount of anthelmintic available against the worms in the small intestine. Furthermore, the anthelmintic undergoes dilution by the fluids and ingesta in the stomach, which dilution may reach a point where it will perceptibly diminish the efficacy of the drug and may render it entirely ineffective.

To avoid the above objectionable effects from the passage of anthelmintics through the stomach, it would appear to be the logical thing to enclose the drug in an enteric coat, so that the drug would be released in the intestine, thereby avoiding absorption and dilution in the stomach. In actual practice, enteric coats are not entirely satisfactory affairs. A number of substances which are comparatively insoluble in the acid gastric juice are used, such as talc-shellac, phenyl salicylate, keratin, and formalin-hardened gelatine, but there are objections of one sort and another to these. In our experience, talc-shellac coatings will open in the stomach at times or fail to open in the upper portion of the small intestine at times, and the formalin-hardened gelatine gets progressively harder with age and ultimately fails to open at all, passing the entire digestive tract.

Tests of soft capsules containing oil of chenopodium and coated with the talc-shellac preparation gave entirely satisfactory anthelmintic results. The dose used was that given by the writer (Hall, 1917) in a previous paper—5 minims for dogs weighing 10 pounds or less, 10 minims for dogs weighing 10 to 20 pounds,

* Resigned March 27, 1919.

15 minims to dogs weighing 20 to 30 pounds, and 20 minims to dogs weighing over 30 pounds. In one or two instances where dogs weighed close to the upper limit of the 10-pound range given here, the additional 5 minims of the range above was given. The tests are given in the following table:

Dog No.	Wt. Kilos.	Dose.	Worms passed.				Postmortem.					Ascaricidal efficacy, per cent.
			Ascarids.	Hookworms.	Whipworms.	Tapeworms.	Day.	Ascarids.	Hookworms.	Whipworms.	Tapeworms.	
65	14	20 v	2	0	0	0	4th	0	0	0	0	100
72	13	20 v*	5	0	0	0	6th	0	0	0	0	100
73	16	20	0	0	0	0	4th	0	0	10	0	...
74	6	10	3	0	0	0	4th	0	0	0	50	100
75	11	15	2	0	0	0	4th	0	0	0	8	100
76	7.5	10	3	0	0	0	4th	0	1	18	1	100
77	10	15	22	0	1	0	4th	0	0	22	76	100
78	12	15	6	0	0	0	4th	0	0	0	65	100
79	9	15 v	5	0	0	0	4th	0	0	0	22	100
80	7	10	6	0	0	0	4th	0	0	4	14	100
81	10	15	1	0	0	0	4th	0	0	0	0	100
82	10	15	108	4	0	0	4th	0	5	0	0	100
84	8	10	0	0	0	0	3rd	0	0	7	0	...
86	15	20 v	2	0	0	0	9th	0	0	0	0	100
91	7	10	4	0	0	0	6th	0	0	0	15	100
92	10	15	13	0	0	0	8th	0	0	1	1	100

v vomited capsules. * received 45 mils castor oil.

There are 16 dogs in the above experiment. The weight is given in kilos (1 kilo = 2.2 pounds). The dose is given in minims, and in all cases was followed immediately by 30 mils of castor oil, except in the case of Dog No. 72, where it was preceded by 15 mils of castor oil and followed by 30 mils additional, 15 minutes after giving the capsules. The 4 dogs marked *v* vomited their capsules, opened, which indicates that these capsules may open in the stomach at times, though the moistened capsule may have opened in the dog's esophagus during vomition or may have been broken by the teeth at this time; the anthelmintic efficacy was not noticeably impaired by the opening of the capsules, apparently. The dogs averaged a little less than 10 kilos in weight; Hall and Wigdor (1918) have shown that 10 kilos is about the average weight for dogs. They received an average dose of a little less than 18 minims, or a little more than 1 mil, which is close to the therapeutic dose of 0.1 mil per kilo which the writer (Hall, 1917) has established experimentally. Two dogs were not infested with ascarids, which is taken by the

writer as the test worm for this anthelmintic. The 14 infested dogs had a total of 182 ascarids, all of which were removed, giving an efficacy of 100 percent. Of a total of 10 hookworms, 4 were removed, or 40 percent. Of a total of 63 whipworms, only 1 was removed, a total of less than 2 percent. Of 252 tapeworms, none were removed, an efficacy of 0 percent.

A series of tests were made with soft capsules containing 5 minims of oil of chenopodium and 10 minims of chloroform each, these capsules being treated to form an enteric coat of the gelatine by leaving them in 1 percent formaldehyde for a half minute to a minute and then allowing at least two weeks to elapse before using. The capsules used were given their enteric coating by Wilbur L. Scoville and were less than a month old when used. After a year to a year and a half, according to Scoville, such capsules become so insoluble that they pass the digestive tract unopened.

In our series of tests we were unfortunate in being unable to obtain enough dogs infested with ascarids or hookworms to give the best sort of test, only 3 dogs out of 14 having ascarids and only one having hookworms. The tests were as follows:

Dog No.	Wt. Kilos.	Dose.	Worms passed.				Postmortem.					Ascaricidal efficacy, per cent.
			Ascarids.	Hookworms.	Whipworms.	Tapeworms.	Day.	Ascarids.	Hookworms.	Whipworms.	Tapeworms.	
98	10	3v	0	0	0	0	4th	0	0	1	371	...
93	8	2	0	0	4	0	11th	0	2	7	0	...
94	10	3	0	0	0	0	11th	0	0	125	0	...
99	8.5	2v	0	0	0	2	4th	0	0	2	0	...
100	11.5	3v*	0	0	0	0	5th	0	0	0	27	...
101	9	3v*	0	0	0	0	5th	0	0	0	0	...
102	7	2v*	0	0	4	0	5th	0	0	0	0	...
103	7	2	0	0	0	0	5th	0	0	0	0	...
104	11	3	4	0	0	0	5th	0	0	0	9	100
106	9.5	3v	0	0	0	0	12th	8	0	0	1	0
107	19.5	3	0	0	0	0	14th	0	0	0	10	...
109	8	2v	7	0	0	0	14th	5†	0	0	0	†58
112	9.25	3v	0	0	0	0	5th	0	0	0	56	...
113	8	2v	0	0	0	0	5th	0	0	0	0	...

v vomited after treatment. * given more than 30 mils castor oil with treatment. † ascarids in stomach.

The weight is given here in kilos. The dose is given in number of capsules, each capsule containing 5 minims of oil of chenopodium and 10 minims of chloroform, as noted above. The

capsules were followed immediately with 30 mils of castor oil, except in the cases noted above, where larger doses were given. Eight of the 14 dogs vomited after treatment, bringing up the capsule in some cases. In one of these cases, Dog 106, where vomiting occurred, though no capsules were found in the vomitus, the treatment was an entire failure against ascarids. These dogs averaged a little less than 10 kilos in weight and received on an average about 13 minims of oil of chenopodium and 26 minims of chloroform. There were ascarids present in 3 dogs: The treatment removed all of these in one case, none of them in another case, where vomition occurred, and 58 percent in another case (Dog 109). In this last case, the dog had 1 ascarid in the small intestine and 4 in the stomach. This develops one objection to the use of enteric-coated preparations for use against ascarids. These worms are notorious for their wandering habits, and the stomach is a favored site for wandering, especially in puppies. Obviously an enteric preparation that passes the stomach unopened will fail to remove ascarids located in the stomach.

While there is something fascinating about the idea of exploding an anthelmintic bombshell in the midst of the worms in the small intestine, there are certain difficulties in the way of a practical application. For one thing, the shell may pass by a number of worms in the duodenum and upper jejunum before exploding, and it is impossible to time the shells for various ranges and bracket the initial shots. It seems likely that the capsule would shove before it such worms as ascarids, especially in masses, until it broke, but it would easily slip by such worms as hookworms or even small ascarids. The treatment failed to remove the 2 hookworms present. It removed 8 of 143 whipworms, a little over 5 percent, and removed 2 of 476 tapeworms, or less than 1 percent.

The results obtained by the use of formalin-gelatine enteric coats, enclosing a mixture of oil of chenopodium and chloroform, are not satisfactory. On the other hand, the results obtained by the use of the talc-shellac coat are unusually good, the minimum therapeutic dose removing all the ascarids present from 14 infested dogs. Whether this efficacy is to be attributed in any part to the anthelmintic coat is debatable.

Just how uncertain is the action of an enteric coat, may be judged from the following experiments:

Dog No. 332, a mongrel weighing 14 kilos, was given three 10-minim soluble elastic gelatine capsules of oil of chenopodium, enteric coated with the talc-shellac preparation, the capsules being followed immediately with 30 mils of castor oil. Two hours and 5 minutes later the dog was shot and 4 minutes thereafter the stomach was opened. The three capsules were found in the stomach unopened; the castor oil had apparently gone on through the small intestine.

Dog No. 334, a wolfhound mongrel weighing 14.5 kilos, was given three similar capsules and the same amount of castor oil. Three hours later the dog was shot and the stomach opened. Two capsules were found in the stomach; the enteric coats were cracked, but the capsules were not opened. One capsule was found in the lower jejunum, similarly with a cracked enteric coat, but unopened. The castor oil was in the cecum and the large intestine.

It appears from the above that enteric-coated capsules may lie in the stomach for long periods, while the accompanying purgative passes out; that the enteric coats may break partly by digesting and partly, perhaps, from mere moistening, softening, and the mechanical effects of peristalsis; that the capsules may pass as far as the lower jejunum, and perhaps to the large intestine without opening; and that of the same lot of capsules, simultaneously administered, some may do one thing and some another. With talc-shellac coats, the ascaricidal efficacy is unimpaired, while no conclusions can be safely drawn from the showing of 40 percent efficacy against hookworms.

Zeigler (1917) has also investigated the possibilities of enteric-coated capsules of oil of chenopodium, from a physiological standpoint and without reference to their anthelmintic value. He used hard capsules, filled with a hypodermatic syringe and coated with salol by dipping in melted salol, drying, and repeating the process until a sufficiently thick coat had formed. He notes that as ordinarily given, dogs will show symptoms of chenopodium absorption within 10 minutes, and that with the enteric coats, symptoms—and presumably absorption—were delayed from 30 minutes to an hour and a half. Of 10 animals given twice the minimum lethal dose (the m. l. d. is 0.5 m. p. k.), only 2 died; some only showed vomiting and salivation. Two animals were given this dose and chloroformed at the end of 2 hours. The capsules had dissolved and evidence of their solution was found in the intestine.

It will be noted that Zeigler's findings differ from those given in this paper. He finds enteric capsules dissolved in 2 hours; we found them still in the stomach in 2 hours, and in the stomach and in the ileum in 3 hours. Of course, the explanation for this may lie in the fact that he used a salol coat on a hard capsule, and we used a talc-shellac coat on a soft capsule.

Zeigler states that "The animals were placed in metabolism cages and watched carefully to see that none of the capsules were vomited or passed in the stools." It is to be regretted that all the dogs in his experiments were not killed and examined post-mortem. It would be interesting to learn why double the m. l. d. of this drug failed to kill or even produce marked symptoms in these dogs. Apparently it is due to the slight absorption of the drug in the intestine, but if this is the case, why did 2 of the dogs die? Did the capsules, perhaps, open in the stomach in these 2 cases? In this connection, Zeigler says: "The absorption is more rapid from the stomach than from the intestines." On the other hand, Salant and Livingston (1915) found that several hours may elapse before evidence of absorption into the circulation could be obtained when the oil was introduced into the stomach of animals, in which the pylorus had been previously ligated, whereas absorption from the duodenum was very rapid. In our own experience, we find that there is considerable variation in the case of individual dogs, but certainly there is a very rapid gastric absorption in most cases, the onset of symptoms following the administration of the drug very promptly. On the other hand, some dogs show little evidence of the presence of the drug at any time. Doubtless the conditions which have been mentioned by Salant and his collaborators enter into these cases—presence of hunger peristalsis, amount of fasting, etc. In our experience, the simultaneous administration of olive oil prolongs the period in which the castor oil remains in the stomach and increases the gastric absorption and production of gastric lesions.

Regardless of the fact in this case, and both findings might be right for the animals experimented on, the writer believes that less is to be expected from enteric-coated capsules which will allow of chenopodium absorption only in the intestines than from the use of such purgatives as castor oil, which will distribute the absorption, and the ensuing shock and insult to the mucosa, over as wide a surface as possible and simultaneously prolong the period of absorption and allow the patient a longer period in

which to dispose of the toxic elements absorbed. Zeigler concludes: "Just what effect this delayed absorption of the oil when administered in enteric capsules would have upon its vermicide effect I am unable to say at this time, but certainly I believe that the most rational method of administering the drug in hookworm disease would be in this manner." The writer cannot regard this entirely reasonable theory as sufficiently established by the available facts. The anthelmintic efficacy with the talc-shellac coats was well maintained, so far as ascarids are concerned, but even these capsules went at times to the ileum without opening, and the efficacy of the formol-hardened capsules was impaired. From the available facts, the writer is of the opinion that enteric coats add to the uncertainties of the action of anthelmintics, though more facts would be welcome.

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Every one was pleased to welcome Dr. Mark Francis, of Texas, at the annual meeting after so long an absence.

All sections of the country, as well as parts of Canada, appeared to be represented at the New Orleans convention.

Dr. E. I. Smith, Chief Inspector, B. A. I., Baton Rouge, La., was recently called suddenly to his home in New York State on account of the unexpected death of his mother, an estimable lady of over eighty years of age. THE JOURNAL desires to extend to Doctor Smith and the other members of the family its sympathy and condolence in their bereavement.

CLINICAL AND CASE REPORTS.

NOTE ON A TOXIN-ANTITOXIN METHOD OF DIAGNOSIS FOR ULCERATIVE LYMPHANGITIS (BAC. PREISZ-NOCARD).

E. A. WATSON,
Department of Agriculture, Canada.

Nicolle, Loiseau and Forgeot have noted the antitoxic power of the serum of horses affected with ulcerative lymphangitis (Bac. Preisz-Nocard). Forgeot and Cesari showed that this specific property could be demonstrated and applied as a means of diagnosis (*Annales de l'Inst. Pasteur, V. xxvi,* 1912), in that a dose of serum from an infected horse would protect a guinea-pig against a lethal dose of killed toxic Preisz-Nocard bacilli—the bacilli being treated by alcohol and ether and dried *in vacuo* over sulphuric acid.

In numerous experiments that I have made in a study of the toxic properties of Preisz-Nocard bacilli I have always found that bacilli treated as above, or if killed by heat or by chemical solutions, lose their toxicity in great measure and are rendered more or less atoxic and harmless for test animals. As a diagnostic agent such preparations had little or no value in my experience. Further experiments showed that the soluble toxin obtained in the filtrate of unheated, highly virulent bouillon-cultures was fatal to guinea-pigs in very small doses and much better suited for a diagnostic test.

Briefly, my method is based on the neutralization of a lethal dose of this soluble toxin by the addition of antitoxic serum. A suitable toxin should have a minimum lethal dose of 1.0 c. c. or less, killing a guinea-pig of average weight and size in 24-36 hours. The same amount of antitoxic serum, or even less, will neutralize the dose of toxin. One must prepare in advance the toxin and determine the required lethal dose. For the diagnostic test this dose of toxin is mixed with an equal quantity of serum of the suspected animal, given 20-30 minutes contact, and then injected subcutaneously or intramuscularly into a guinea-pig. The control is given the lethal dose of toxin alone, and will die within 24-36 hours. The test guinea-pig survives and is apparently none the worse for the experience, that is, if the serum

origin is a horse carrying the disease. On the other hand, if the serum origin is a normal horse or a diseased animal in which Preisz-Nocard infection does not exist, the test guinea-pig succumbs to the toxin in approximately the same time as the control.

The following is a demonstration test just recently made:

The suspected animal was an army horse detained under quarantine before admission to Canada after service overseas. No history of the animal having suffered from the disease was obtainable. During the period of detention at the port of entry the animal had been treated for a purulent sore in the region of the fetlock of the hind leg. At this inspection this old sore had healed and cicatricised, but another ulcer had broken out a few inches above the old one, and had, a day or two previously, so it was said, discharged blood and pus.

For demonstration purposes, 6 guinea-pigs were used: Numbers 1, 2 and 3—the controls—were given injections of toxin in doses of 0.5 c. c., 1.0 c. c., and 2.5 c. c., respectively. Numbers 4, 5 and 6—the test animals—received a mixture of equal parts of toxin and the suspected horse serum (20 minutes contact) in double the amount given above, so that each test animal received the same amount of toxin as the control.

The three controls died in from 24-36 hours after injection. The three test animals survived, apparently unaffected by the injections, thus demonstrating with certainty that the suspected horse serum had specific antitoxic and neutralizing action on Preisz-Nocard toxin.

Diseases originating with the Preisz-Nocard bacilli, and differing widely in clinical aspects, occur in different species of animals. In the horse the disease may occur in the form of ulcerative lymphangitis of one or more limbs, or as a large pus cavity situated anywhere in the body, in the muscles, or under the skin; also, and not infrequently, as renal abscesses while no outward signs of infection are present. The disease is essentially of a rebellious and recurring character. In the intermittent or sleeping stages and in those forms of infection in which clinical symptoms are absent, the toxin-antitoxin test method permits an accurate diagnosis.

ACKNOWLEDGMENT.

The demonstration test noted above was made at the Research Station, Ottawa, by kind permission of Dr. F. Torrance, Veterinary Director General, and of Dr. S. Hadwen, pathologist.

AN OUTBREAK OF BLACK LEG IN SHEEP

HADLEIGH MARSH,
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Although blackleg is recorded in the literature as occurring in sheep, veterinarians and stockmen generally consider that sheep are not susceptible to this disease. It may be that, due to this fact, a diagnosis of blackleg is not made in some cases where sheep have been lost from this cause. However this may be, the diagnosis of blackleg in sheep is so seldom made, that the history of an undoubted outbreak should be of interest to veterinarians.

In this instance, the disease occurred in a bunch of 270 yearling Rambouillet bucks. The original diagnosis was made by Dr. N. T. Gunn, of Butte, and Dr. H. L. Jones, of Drummond, Montana. They forwarded tissues to the laboratory, and the diagnosis was confirmed. Vaccination was advised, and all the sheep were vaccinated with blackleg aggressin in 2 c. c. doses. This apparently checked the disease, but a month later there was a recurrence. At this time an investigation was made from the laboratory, and again the diagnosis of blackleg was confirmed by careful laboratory experiments.

The detailed history of this outbreak is of interest as indicating the conditions under which animals become susceptible, and the possible means of spreading the infection. The sheep were being run on a timothy and clover meadow during the month of August. This field had no history of blackleg for a number of years, either in cattle or sheep. About the last week in August, a ewe got into the pasture with the bucks, which caused severe fighting among the bucks for several days. About ten of the sheep died at this time, and the owner thought at first that they were killing each other, as all those that died were badly bruised. The deaths continued, and by August 30th eighteen had died. On this date Dr. Gunn and Dr. Jones made a post mortem examination of a sheep that had died within a few hours, and found typical blackleg lesions.

A specimen of the affected muscle was sent to the laboratory. Smears of this material showed organisms with the characteristic morphology of the bacillus of blackleg. A guinea pig was inoculated with some of the tissue, and developed typical blackleg lesions, in which the bacillus was demonstrated.

On Sept. 5th all the sheep were vaccinated with blackleg aggressin, using 2 c. c. doses. Four more died after vaccination,

and then the losses ceased. At the same time the sheep were turned into another pasture. The owner allowed the carcasses to lie in the field, without being buried or burned. Some time later the sheep were moved back into the field where the losses first occurred, and the owner irrigated the field.

On October 6th, one month after vaccination, four deaths were reported, and on October 8th three more died. At this time an investigation was made from the laboratory. A post mortem examination was made on one sheep. No lesions were found in the internal organs. The muscles of the face, jaws, neck and breast showed edema and hemorrhages. The muscles were dark red, and contained some gas. When the affected muscles were cut, the characteristic odor of blackleg was noticed. Muscle tissue from this sheep, and a specimen of soil and grass from the field where the loss occurred, were brought to the laboratory.

A small piece of the soil was inoculated under the skin of a guinea pig, without any visible effect.

Smears from the specimen of muscle showed the presence of the bacillus of blackleg. A guinea pig was inoculated with this material. After twenty-four hours, this pig showed no apparent systemic reaction, but there was a marked edema of the leg into which the inoculation was made. As an early diasnosis was desired, the guinea pig was killed and post mortem examination made. Smears from the bloody exudate showed the presence of the blackleg bacillus. Another guinea pig and a rabbit were immediately inoculated with this exudate.

The second guinea pig died in less than twenty-four hours with typical lesions of blackleg. The organism was recovered in anærobic cultures. The rabbit, on the other hand, developed only a slight swelling in the inoculated leg, from which he soon recovered. This fact helped to confirm the diagnosis, as rabbits are considered to be relatively immune to blackleg.

In order to complete the evidence in this case, a sheep was inoculated with some of the affected muscle which had been taken from the sheep which had been autopsied at the ranch. This sheep died in about twenty-five hours, and post mortem examination was made after he had been dead over night. At the time of post mortem examination, the blackleg bacilli had invaded all the internal organs, and the muscles and subcutaneous tissue showed the characteristic changes over the whole body. Typical blackleg bacilli were identified in smears from the muscle,

heart blood, pericardial fluid and kidney. The organism was recovered in pure culture from the various organs.

Especial pains were taken in this case to confirm the diagnosis, which was definitely blackleg. The history shows that the blackleg infection must have been present in the meadow where the sheep were run, although the owner knew of no previous outbreak of blackleg at this place. This indicates that the organism is very generally distributed, and may cause disease at any place when the proper conditions exist. In this instance, the bucks were made unusually susceptible by their severely bruised condition due to fighting. At the same time the field was irrigated after a dry season which probably made the blackleg spores more available, and may have caused germination of spores.

The vaccination with the aggressin prepared for use with cattle, apparently checked the original outbreak, as Dr. Jones reported that four sheep died within a few days after vaccination, and then there was no more loss until a month later. When all the conditions are considered, the second outbreak need not throw doubt on the immunizing value of the vaccine. Due to the fact that the owner, in violation of state regulations and contrary to the instructions of the attending veterinarian, allowed more than twenty carcasses of sheep dead of blackleg to remain unburied, and then irrigated the field, an enormous number of virulent spores were probably spread over a considerable area. The result was, in my opinion, that the sheep were subjected to such an overwhelming infection that their immunity was broken down in some cases.

Dr. J. F. Winchester, of Lawrence, Mass., attended, by invitation, a meeting at Worcester, October 25, held under the auspices of the Cattle Commissioners, at which he was called upon to answer questions relative to the inspection of cattle and experiments made in the use of tuberculin.

Dr. N. S. Mayo, Secretary of the A. V. M. A., has accepted an invitation to attend the California Veterinary Medical Association's Short Course for Veterinarians to be held at the University Farm on December 29, 30, and 31, and to assist in the program. The Southern California Auxiliary will hold their meeting at Los Angeles on January 2 and 3. The same speakers will go from University Farm to assist in the meeting at Los Angeles.

ABSTRACTS.

ALYPIN IN THE NERVOUS FORM OF DISTEMPER.

Jakob, in the *Tijdschrift voor Veeartsenijkunde*, reports the following observations: He has repeatedly used intra-lumbar injections of Alypin in the nervous form of distemper. He performs the injection between the last lumbar vertebra and the sacrum, and has also given some subcutaneous injections. He concludes that when myelitis and encephalitis appear in the course of distemper, with symptoms of paralysis and rhythmic and clonic contractions, lumbar injections of Alypin produce favorable but transient effects. He also finds that the dog supports high doses of this drug. Symptoms of intoxication do not appear even after the injection of five centigrammes of Alypin to the kilogramme of live weight.—*Annales de Méd. Vét.*

THE ACTION OF SOME DRUGS UPON THE PULMONARY VESSELS.

Bereoine published the following observations in the *Rousski Vratch* of 1914: Adrenalin, in concentrations which produce a very strong constriction in the peripheral vessels, manifests no action on the pulmonary vessels; and even vaso-dilation is frequently observed. Nicotine, pilocarpine, and barium chloride produce vaso-constriction in the pulmonary vessels. Caffeine produces first pulmonary vaso-constriction, and afterwards, rapidly and constantly, a consecutive vaso-dilation.

Atropine has no appreciable influence upon the pulmonary vessels; but, if these were previously contracted (under the influence of pilocarpine, for example) atropine causes the contraction to disappear. (*Revista de Hygiene y Sanidad Veterinaria*).—W. R. C. (*Vet. Rec.*)

POLYNEURITIS OF FOWLS.

C. Sanz Egana,
Revista Vet. Espana. Vol. XII, No. 6, June, 1918, pp. 241-247.

The author has encountered in Malaga a polyneuritis in fowls which he regards as due to "deficiency" or avitaminosis.

The flock in which the disease appeared was kept exclusively for the purpose of consuming injurious insects, and had to live almost entirely on what food the ground provided. Occasionally a feed of seeds of sweet sorghum was furnished to them in special circumstances, but this was seldom.

The disease presented itself generally in a chronic form, and the first symptoms which indicated illness were pains in the legs and difficulty in walking. The gait was vacillating, with incoordination of movements. Little by little the paresis increased, the feathers were held erect, and the wings became involved and pendulous. Paralysis of the neck was accompanied by rigidity and contractures simulating those of tetanus, and there were manifestations reminiscent of those exhibited by a pigeon from which the cerebellum has been removed. Dysphagia accompanied paralysis of the neck. Respiratory symptoms (accelaration, dyspnœa) and general emaciation were very marked. General sensibility diminished greatly. In most instances the disease lasted from fifteen to forty days, but there were more acute cases in which death ensued in from five to eight days.—*Vet. Rev.*

TRACHEOSTOMY.

F. CINOTTI.
La Clinica Vet. Vol. XLI, No. 18. 30th September, 1918, pp. 457-462.

Arguing from analogy, the author suggests that the term *tracheostomy* should be employed to designate the operation by which a permanent opening is made into the trachea. He recommends that the operation should be performed in the following manner: The horse should be cast, and, preferably, placed on his back, with the head and neck fixed in an accurately extended position relative to the body. The seat of election is in the upper fourth of the neck.

The skin is shaved and a local anæsthetic applied. An oval piece of skin is incised, the long axis of the oval being about 6 cm. in length and corresponding to the long axis of the neck. The shorter transverse diameter should be about 3 cm. The segment of skin thus circumscribed is removed.

The musculature of the neck having been exposed, an oval segment of the muscles, equal in extent to the piece of skin already removed, is excised with curved scissors. This is facilitated by first dissecting the muscles in the middle line of the

neck. During the removal of the muscles it is imperative that the head and neck be held in exactly the correct position, otherwise there is the possibility that an unsightly deformity may be produced. The perichondrium over each of three or four tracheal rings is cut through, and segments of the cartilages shelled out of their perichondrial covering. That is to say, the internal perichondrium is left intact, so as to avoid injury to the mucous membrane. It follows that the segment of each tracheal cartilage must be removed separately. The mucous membrane is now incised in the middle line, and accurately stitched to the margin of the skin, care being taken that the sutures do not cut the mucosa.—*Vet. Rev.*

INFECTIOUS ABORTION IN CATTLE.

Since Bang's discovery of a characteristic micro-organism associated with so-called "contagious abortion" in cattle, it has become customary to attribute the disease to *Bacillus abortus* described by him. The assumption that this is the sole or even the predominant etiologic agent concerned with a malady that occasions enormous economic losses has diverted attention away from the microbial cause and toward prevention or cure. Aside from the indirect interest that bovine disease represents in relation to human welfare, and particularly when the milk supply is involved, the bacillus of contagious abortion in cattle has lately been discussed as a possible agent of more direct menace in childhood.

The newer studies at the Department of Animal Pathology of the Rockefeller Institute for Medical Research, Princeton, N. J., under the leadership of Theobald Smith,[1] bring unexpected evidence that contagious abortion may involve something more than Bang's bacillus. They include the discovery of a spirillum of definite morphologic and cultural characteristics designated by Smith as *Vibrio fetus* and found associated in a considerable series of cases with what is commonly known as infectious abortion in cattle. He properly maintains that the isolation in pure culture of a definite morphologic entity, a vibrio, with practically the same biologic characters, from a series of cases of the same clinical complex, establishes a presumption in favor of the

1. Smith, Theobald: J. Exper. Med. 28:701, 1918. Smith, Theobald, and Taylor, Marian S.: Ibid. 30:299 (Oct.) 1919. Smith, Theobald: Ibid. pp. 313, 325. Smillie, E. W.; Little, R. B., and Florence, Laura: Ibid, p. 341.

specific identity of the organism and also in favor of the inference that such organisms are etiologically related to the diseased condition. It might be assumed that *Vibrio fetus* found in the fetal membranes is merely an invader from the more external genitalia or from the blood after the fetus has been damaged by other agencies. However, the fact that disease of the fetal membranes has been produced experimentally by injection of pure cultures of the vibrio strengthens the presumption that it may be a true cause of infectious abortion.

The new investigations indicate that many cases of abortion in cattle occur without evidence of the presence of Bang's bacillus. In general, *Bacillus abortus* is associated with first pregnancies, and its presence rapidly diminishes in frequency in later ones. Apparently an immunity to this bacillus may become developed in cattle, whereupon *Vibrio fetus*, and perhaps to a far less degree, miscellaneous septic and pyogenic micro-organisms, may become the inciters of abortion in later pregnancies. If these conclusions become substantiated by further studies, it will become clear that abortions in cattle are attributable to a variety of infectious and noninfectious agencies. Even now it seems established, however, that the udders of a relatively high percentage of cows become infected with *Bacillus abortus*, probably during their first abortion disease. In this way the relation of this micro-organism to the milk and consequently to human health is worthy of consideration.—*Jour. Amer. Med. Ass'n.*

While a number of the prominent Canadian members were absent, the "Chilly North" was well represented at the A. V. M. A. meeting.

BRITISH HONORS FOR COLONELS WHITE AND MARSHALL.

We are very pleased to note that at a recent meeting of the Royal College of Veterinary Surgeons, London, England, the names of two of our distinguished members are among those who were elected Honorary Associates of the Royal College, viz., Colonels David S. White and Clarence J. Marshall. This is quite an honor, and THE JOURNAL heartily congratulates the recipients, in which we have no doubt the profession generally will join us, as it is only conferred for distinguished service of some kind.

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

THE FIFTY-SIXTH ANNUAL MEETING OF THE A. V. M. A.

The second southern meeting of the A. V. M. A., during the fifty-six years of the Association's existence, recently held in the City of New Orleans, has now passed into history. The A. V. M. A. was to have met in New Orleans in 1914, but on account of the extensive epizoötic of foot and mouth disease raging at the time, the meeting was called off, owing to so many of the members being on duty in their respective states in connection with the outbreak. However, while the postponement was a disappointment at the time, we believe the Association gained by it in the long run, as many more members were added to the organization in the interim, and hence a larger attendance was ensured by the wait of a few years.

Perhaps the chief desideratum in connection with the late meeting was the weather; and if any one has any fault to find with the variety served up to them during the week of the 56th annual meeting, they are surely very hard to please. If previous arrangements had been made with the "weather man," he could not possibly have been more considerate. The weather was simply ideal; and we believe everybody returned home with that impression; and with pleasant recollections of their trip to the Crescent City.

Members and visitors arrived early, and when the meeting was called to order by President Moore for the opening session, the large auditorium of the Hotel Grunewald was comfortably packed, and with many ladies among the audience.

Governor Ruffin G. Pleasant, of Louisiana, who was to have welcomed the Association on behalf of the State, was unavoidably absent on official duty, commissioned Dr. W. H. Dalrymple to take his place, which he did by extending the Governor's regrets, and adding a few extemporaneous remarks of his own by way of welcome.

His Honor Mayor Behrman extended a warm welcome to the Association to the City of New Orleans. Mayor Behrman is not altogether unknown to many of the members, as he attended the

meeting in New York in 1913, and extended a hearty welcome to the Association to meet in New Orleans in 1914—the meeting which had to be called off.

On behalf of the Louisiana State Board of Health, the Association was warmly welcomed by its distinguished President, Dr. Oscar Dowling, who, as a sanitarian, has a national reputation.

The foregoing addresses were responded to by Dr. David S. White, of Ohio, Dr. John W. Adams, of Philadelphia, who was to have done so, being late in arriving.

The work of the Association was, as usual, divided into sections, all of which had full programs of interesting topics for discussion. A very interesting part of the program was that devoted to the Army Veterinary Service, both at home and abroad, and which included the British Army Veterinary Service, a paper being presented by Col. D. S. Tamblyn, Regina, Sask., a member of the Canadian Service.

In addition to the papers presented on the Army Veterinary Services, there were some excellent slides and moving pictures showing the activities of the A. V. C. both in the United States and abroad, the films being in charge of a representative of the Signal Corps of the U. S. Army; and the Army Veterinary Service was represented at the meeting by Lieut.-Col. R. J. Stanclift, Assistant Director of the Army Veterinary Corps, and Major Robert J. Foster from the office of the Surgeon General.

Among other matters of importance, the Section on Sanitary Science and Police was occupied with discussions on Infectious Equine Anemia, or Swamp Fever; Abortion Disease; Tick Eradication; Tuberculosis Eradication; Parasitic Diseases; Carriers of Anthrax Infection, etc.

The Ladies' Auxiliary, also, had their section, and transacted business in connection with their branch of the Association.

An invocation was offered by Mrs. F. H. Schneider, Philadelphia, after which a few words of welcome were presented by Mrs. W. H. Dalrymple, of Baton Rouge, La.; and the president's address was delivered by President Mrs. W. Horace Hoskins, of New York City.

The officers for the Auxiliary for the ensuing year are: President, Mrs. W. H. Hoskins, New York City; Recording Secretary, Mrs. Chas. E. Cotton, Minneapolis, Minn.; Corresponding Secre-

tary, Mrs. Ash Lockhart, Kansas City, Mo.; Treasurer, Mrs. Thos. E. Smith, Jersey City, N. J.

The entertainment feature was all that could be desired, and everybody seemed to enjoy it. The ladies were kept busy seeing the sights of New Orleans, and were given a card party and luncheon at the Southern Yacht Club. Perhaps the most pleasurable part of the entertainment, participated in by both ladies and gentlemen, was a three hours' boat trip on the Mississippi River seeing the extensive system of docks and warehouses at the Port of New Orleans. An elegant excursion steamer was provided, where dancing was enjoyed by both the older and younger members and their wives; and a "spieler" was on board to point out and explain what was to be seen as the S. S. Sydney glided up and down the "father of waters." It should be mentioned that the steamer trip was a donation, to the Association, from Pitman-Moore Company, of Indianapolis, Ind.

The annual banquet was, as usual, very much enjoyed by a large number of those attending the meeting. The selection of Dr. John W. Adams, of Philadelphia, as toastmaster, who was introduced by President V. A. Moore, was a very happy one, and in his inimitable way, played his part well, his amusing introductions of the various speakers invariably bringing forth roars of laughter. The toast, the "Chilly North," was responded to by Dr. C. D. McGilvray, of Toronto, Canada, who interspersed his remarks with numerous stories about the "Land O' Cakes," the Doctor himself hailing from the country of Bruce, Burns, Carlyle and other Scottish notables. "The Sunny South" was responded to by Dr. C. A. Cary, of Alabama, our new President, who, although not a Southerner born, has lived south of the Mason and Dixon line for well nigh thirty years, and was able to expatiate on the South's great possibilities. Mrs. Ash Lockhart, of Kansas City, spoke for the Ladies' Auxiliary in a delightful little speech which was much enjoyed. Dr. R. W. Tuck, of New Orleans, did the honors for our great national Bureau of Animal Industry. Major Robt. J. Foster replied entertainingly for the Army Veterinary Service. Dr. Fred. J. Mayer, of Louisiana, responded for the Medical Profession in a delightful speech, splendidly delivered, which captured his auditors, and finished by a recital of his famous "Sanitary Kiss," which "captured the crowd." Finally, "The Ladies" were looked after by Dr. J. H. Blattenburg, of Lima, Ohio. And every one who knows Blattenburg is

aware that he is at his very best when his attention is directed toward the fair sex. So it goes without saying, that he did the toast full justice.

We believe it was conceded by all that the New Orleans meeting was one of the best in the history of the Association, both in point of attendance, in the quality of the program, in the entertainment provided, and in the delightful weather conditions during the entire time; and that all left with pleasant recollections of the big city of the Pelican State, and with the hope that it might not be so very long before they again had an opportunity to enjoy the hospitality which is proverbial of the South.

The City of Columbus, Ohio, was voted the 1920 meeting of the Association, where a very large outpouring of the profession is anticipated.

The following officers were elected for the coming year:

President, Dr. C. A. Cary, Auburn, Ala.

Secretary, Dr. N. S. Mayo, Chicago, Ill.

Treasurer, Dr. M. Jacob, Knoxville, Tenn.

Vice-Presidents: Lieut.-Col. J. H. Gould, U. S. Army; Dr. E. A. Watson, Lethbridge, Alberta, Canada; Dr. E. P. Flower, Baton Rouge, La.; Dr. A. Eichhorn, New York; Dr. A. S. Cooley, Cleveland, Ohio.

Dr. Jno. R. Mohler, Washington, D. C., was elected Editor and Business Manager of THE JOURNAL of the Association to succeed Dr. W. H. Dalrymple, of Baton Rouge, La., who had resigned.—D.

No use discussing toastmasters. Dr. Adams "takes the cake"; you can't beat him.

President Moore's address was a splendid effort, and ought to be read and studied by every member.

Dr. and Mrs. A. H. Baker are faithful in their attendance at the A. V. M. A. meetings, and we feel sure they must have enjoyed themselves at the New Orleans function.

Dr. J. F. Winchester seems to look younger and enjoy himself better at each succeeding meeting of the Association. His recent appointment by the American Public Health Association is a distinct honor to the profession.

OTHER ASSOCIATIONS.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

ANNOUNCEMENT.

The next meeting of the Minnesota State Veterinary Medical Association will be held in St. Paul, Wednesday and Thursday, January 7 and 8, 1920.

C. P. FITCH, Secretary.

WESTERN NEW YORK VETERINARY MEDICAL ASSOCIATION, INC.

The sixth semi-annual meeting of the Western New York Veterinary Medical Association will be held December 12, 1919, at the Erie Co. S. P. C. A. Building, 121-123 W. Tupper St., Buffalo, N. Y. The meeting will be called at 1 p. m. sharp. All licensed practitioners of Western New York are cordially invited.

F. F. FEHR, Secretary.

NEBRASKA VETERINARY MEDICAL ASSOCIATION.

The twenty-second annual meeting of the Nebraska Veterinary Medical Association will be held December 9-10, 1919, at the Lincoln Hotel, Lincoln, Nebraska.

After postponing the meeting last year on account of the war conditions we are putting forth considerable effort to make this a rousing good meeting and expect to have a large attendance.

We have secured some excellent material for our program, which is timely and popular, for the purpose of creating as much interest as possible.

S. W. ALFORD, Secretary.

THE ILLINOIS-MISSOURI VETERINARY MEDICAL ASSOCIATION.

This Association held its thirteenth semi-annual meeting in East St. Louis, Ill., on October 30. An excellent clinic was held

in the morning at the hospital of Dr. Menestrina; and in the afternoon a lively program was gone through which called forth plenty of interesting discussion. The literary part was held at the city hall.

The Association reports a healthy growth, with a few new members being added at each meeting.

The next meeting of the Association will be held in St. Louis, Mo., some time in April, 1920. The officers of the Association are:

President—Dr. Jenneman, St. Louis, Mo.
Secretary—Dr. Finnegan, Chester, Ill.
Treasurer—Dr. Ratz, Red Bud, Ill.

NORTHWEST WISCONSIN VETERINARY ASSOCIATION.

The second annual meeting of the Northwest Wisconsin Veterinary Association at Eau Claire closed with a banquet at the Eau Claire Cafe. Interesting business sessions were held during the day, some very instructive papers being read. Twenty-eight members of the Association were in attendance.

Dr. A. P. Lien, of Stanley, was elected president; Dr. T. Wrigglesworth, of Eau Claire, vice president; Dr. H. E. Horel, of Augusta, secretary and treasurer; and H. A. Smeltzer, of Baldwin, trustee for three years.

The following were the speakers:

Anæsthetics in Practice—Dr. W. F. Nolechet, Thorpe.

Differential Diagnosis and Treatment of Swine Diseases—Dr. J. T. Percell, Madison.

Case Reports—Dr. J. B. Collins, Chippewa Falls.

The Use of Strychnine in Cattle Practice—Dr. A. J. Abbott, Marshfield.

Case Reports on Equine Hemorrhagic Septicemia—Dr. Leonard Hart, Jr., Chippewa Falls.

Veterinary Current Events—Dr. O. H. Eliason, state veterinarian, Madison.

Those present were: H. A. Smeltzer, Baldwin; S. O. Lewis, Glenwood City; H. E. Horel, Augusta; A. J. Abbott, Marshfield; L. R. Cummings, Spring Valley; E. M. Stein, Elmwood; W. J. Nolechek, Thorpe; G. I. Gregory, Colfax; W. R. Swan, Stevens Point; C. A. Brown, Red Wing, Minn.; P. E. Nulph, Greenwood;

M. B. Ketchpaw, Bloomer; J. B. Collins, Chippewa Falls; J. B. Wilson, St. Croix Falls; H. E. Hensel, Arcadia; O. H. Eliason, Madison; J. T. Percell, Madison; L. G. Hart, Sr., Chippewa Falls; Wm. F. Kuester, Menomonie; A. F. Brown, Eau Claire; T. Wrigglesworth, Eau Claire; Birt Wrigglesworth, Eau Claire; H. D. Larzelare, Menomonie; J. F. Mack, River Falls; M. E. Nugent, Ellsworth; A. L. Troessler, Mondovi; Robert Dixon, Superior; G. B. Kramshuster, Bloomer.

REPORT OF THE ANNUAL MEETING OF THE BRITISH COLUMBIA VETERINARY ASSOCIATION.

The annual meeting of the British Columbia Veterinary Association was held in the Knights of Pythias Hall, Victoria, B. C., on September 25, 1919.

The business meeting of the Association was called to order at 9:30 a. m. by the Vice-President, Dr. A. J. Damman, who read a telegram from the Hon. Dr. S. F. Tolmie, our President, regretting that he would be unable to be present, being in Ottawa, and hoping that we would have a successful meeting and a good time in his home town. Dr. A. J. Damman then outlined the activities of the Association during the past year, particularly its efforts to secure an adequate system of meat inspection for British Columbia, and stated that a bill had been drafted by the Association and a great effort had been made to get it passed at the last session of the legislature, securing support from three-fourths of the city and municipal bodies, various clubs and women's organizations throughout the Province, they sending telegrams to the chairman of the Provincial Board of Health and their local member. A deputation of the Association, consisting of Drs. Damman, Jagger and Chester, being intrduced by Dr. S. F. Tolmie, had interviewed members of the Cabinet on the subject and had convinced them of the necessity for better meat inspection, which they acknowledged. However, the bill failed to pass, but the legislature agreed to appoint a Committee on Public Health, to which a veterinarian, a member of this Association, would be appointed, the committee to report at the next session of the legislature in January. Dr. Damman then requested the members on their return home to start a campaign of public education to the necessity for proper meat inspection and that he felt sure that a bill would be passed in January making at least

a start on compulsory meat inspection covering the more populated areas in British Columbia.

The Vice-President then referred to a complaint received during the past year from one of the members over the sale of biological products direct to farmers and stock men, which was considered detrimental to the veterinary profession and live stock interests, as the laymen were not trained to use such products successfully. A committee had been appointed who had interviewed agents of some of the leading biological companies, and he outlined the result and suggested the matter be discussed further later. Dr. Damman then suggested the by-laws be amended so that associate members be allowed to vote but not hold office and concluded by saying that in these days of unions it was up to the members to support the Association, to secure proper recognition of the profession and to the individual members of it.

The Secretary, Dr. K. Chester, then read the financial statement and was able to report a better showing than last year.

Dr. Chester also reported that while away on a vacation on Vancouver Island he had found out that a Dr. A. Macdonald had been appointed to the Provincial Veterinary Service, he not being a member of the Association, which is directly contrary to the B. C. Veterinary Act. Dr. Chester said that being in Victoria he had gone to the Parliament buildings and interviewed Dr. D. Warnock, Deputy Minister of Agriculture, on the subject, showing him a copy of the B. C. Veterinary Act. Dr. Warnock replied that the Civil Service Commission had recognized the Animal Contagious Diseases Act, which states than an inspector can be appointed, notwithstanding the B. C. Veterinary Act. The existence of this clause was not known to the Association.

Dr. Chester then discussed the matter on a different basis with Dr. Warnock, who was glad to support the Association, and agreed to request from the Association, as Deputy Minister of Agriculture, an interim certificate for Dr. Macdonald, good until the date of the next examination. This was received, and interim certificate granted, and Dr. A. Macdonald was present at the meeting, and was quite willing to join the Association and had expressed his intention to take the examination in the regular way in November. Discussion ensued and it was requested that the incoming Council attempt to get the clause in the Animal Contagious Diseases Act amended.

In addition to the subjects mentioned in the Vice-President's address which were discussed, the subject of the indiscriminate giving of tuberculin direct to farmers by a government department, a specific case being mentioned by Dr. Howell, and the use of tuberculin by private practitioners, and the testing of the animals a few days later by the provincial inspector, not knowing that they had been injected a day or two previously. Discussion took place and it was agreed that when a private practitioner made a test he should fill out a report to the government immediately, and in the matter of supplying tuberculin to farmers, Dr. Chester suggested that now would be a most opportune time to take the matter up intelligently, Dr. S. F. Tolmie being Minister of Agriculture, and a committee was appointed to interview him on the subject.

The Secretary then read various correspondence, which was approved, and a letter from the Hon. S. F. Tolmie resigning as President of the Association on account of his public position, but promising active support of the Association and profession as before.

The election of officers then took place, ten being nominated. The following seven were elected: President, Dr. A. J. Damman; Vice-President, Dr. H. Keown; Secretary-Treasurer, Dr. Kenneth Chester; Council, Drs. Turley-Brooks, White and Jagger; Examiners, Drs. Chester, Turley-Brooks and White.

At the conclusion of a most successful business meeting the members were guests of the Rotary Club at their luncheon, 150 of the business men of Victoria being present. After the luncheon short remarks on the necessity for meat inspection were made by Drs. Damman, Strong and Chester, the Rotarians showing their accustomed interest by asking questions, and they promised their support.

In the afternoon the members made a trip in automobiles to various farms in the Saanich District, including that of Dr. S. F. Tolmie, and in the evening a public meeting was held, the speakers being Dr. Damman on meat inspection, and lantern slides made by Dr. Davis, at present in Alberta, of conditions found on inspection in a packing plant, explained by Dr. Bruce. Then a few remarks by Dr. Strong, meat inspector for the City of Vancouver, on the same subject. Dr. Bruce, of Agassiz, then read a very interesting paper on some of the poisonous plants of British Columbia, showing beautiful pressed specimens of the

plants, and took great pains to show how to distinguish the poisonous plant, wild parsnip, that causes the death of a good many cattle yearly in this Province. Dr. T. A. Sleeth made a few remarks on the diseases of dogs, and answered questions.

This brought a most successful annual meeting to a close.

KENNETH CHESTER, Sec.-Treas.

SPEECH BY DR. WM. THOMSON AT ROTARY CLUB LUNCHEON.*

Gentlemen Rotarians: In my brief address today, I desire to say that while the properly qualified veterinarian may never receive the same éclat as his medical compeer, yet he is equally responsible and absolutely indispensable for the preservation of the public health, inasmuch as he is the only authority on disease transmissible from the lower animals to mankind. Whilst most medical doctors have failed to impress the powers that be of the necessity of meat inspection, this is no wonder, because they are by their qualifications unfitted to pass an opinion on animals that supply us with milk, meat, butter and cheese, dripping and lard, which are the main constituents of our diet. They are peculiarly devoted to the *cure* of disease in man; and fortunate is the person afflicted with diseases like tuberculosis, for example, whose bank roll can command the best attention. But what of the uncomplaining poor: they may get advice from hospitals and clinics, perhaps supplemented by some medical treatment. A corner in a sanitarium is not always available, and the local hospitals do not always have beds for them, and in lots of places they are not wanted at all.

No man sets himself a higher task than he who labors to prevent the infection of his kind from tuberculosis and kindred diseases, obtainable from the lower animals. In my opinion, Dr. Torrance, the Veterinary Director General at Ottawa, is doing more to safeguard the children and susceptible people of Canada from this dreaded scourge than all other institutions together. Now, with the advent of Dr. S. F. Tolmie to the portfolio of Minister of Agriculture, we are already informed of the Dominion department's intention to institute the accredited herd system, by which in time, if applied to all sections, would reduce tuberculosis in cattle to a very large extent. But until there is some proper system of meat inspection in this Province, and so long as the Dominion Meat Inspection Service has to maintain the high

* Read by Secretary Chester.

standard set for excellent quality of meat for export to foreign countries, the absence of any provincial standard for the protection of the home consumer from what is left, is highly detrimental to the national health.

Last week I destroyed a milch cow for tuberculosis; and on post mortem examination I found the lungs containing tubercles as large as three inches in diameter. The lungs were rotten, but the owner remarked on the nice looking meat in the quarters. I asked him if he would cook the lungs and feed it to his family. He replied: "Certainly not." "Why, then, would you use the quarters?" I asked. Now, gentlemen, had this cow been killed in one of the many filthy rural slaughter houses of this Province, is there any one here credulous enough to believe it would have been condemned? No! the lungs with all the evidence of disease would in all probability have been cut out and not destroyed, but thrown to the swine herd that usually are waiting under the killing floor to receive not only the trickling diseased blood but the entrails of all animals slaughtered, including that of their own kind. When we know that the blood in the living animal circulates and makes a complete round of the body in a few seconds, and from the diseased tissues to the healthy tissues, it follows *ipso facto* that if one part be diseased extensively, the other parts must at least contain the elements of susceptibility. And if we feed our children on susceptible meat, it follows again, their tissues are being built on such elements, and must also become susceptible to tuberculosis. If uninspected milk is apt to convey to our children tuberculosis, there is no less danger eating the flesh and organs that produce this milk. Some people might contend that meat is generally well cooked and in this state will not convey disease. Cooked or uncooked, I maintain it contains all the elements that make for disease. For instance, manure a piece of barren soil sufficiently and see if you do not get a good crop. The tubercle bacilli lives on manured soil, or in other words, fertilized tissues that have had to exist on the elements of susceptible meat. This explains why the poorer classes have more tuberculosis by far as compared with the well to do classes. The latter can always afford to buy the very best meat, whereas the old cows sold in the many markets go to the men who cater to the poorer class of people.

In India, where I lived many years, I never saw or heard of tuberculosis among the three hundred million Hindus; but

among the fifty million moslems this disease was fairly common. The Hindus only eat mutton, which is seldom if ever tuberculosed; the moslems eat the flesh of cows like white people. Now let's turn to the Jews. Who ever heard of this unhygienic living race having consumption? Very seldom if ever. The rabbi will not allow his people to eat any meat that on the killing floor (and that is the only place to see it, gentlemen) shows the least sign of this disease. Is all this not sufficient proof that our people are being continually afflicted by this plague through the medium of uninspected meats. Gentlemen, a rigid milk inspection without a rigid meat inspection is only a half-hearted protection. In fact all the money spent in killing tubercular milch cows in this Province cannot obtain for the people the desired full protection without a rigid system of inspecting the carcasses of food animals in all the slaughter houses. Many butcher shops now contain the sign on their fronts "Government Inspected Meat." Let me tell you that if you do not see the label affixed to the portion of meat from which your cuts are taken, and bearing the words "Canada Approved," your meat has not been inspected by the competent federal meat inspectors, and that the shop sign is only calculated to deceive the public on that point. I can give you many instances of what I term emergency meat. The following will suffice: Somewhere in British Columbia this year, a farmer had a cow which for days labored to deliver a calf, and at last being exhausted she collapsed. The owner, instead of sending in good time for a veterinary surgeon, was too mean to pay for one, and as a last resort he operated by cutting through the animal's sides and extracted two beautiful live calves. The cow after undergoing such a cruel operation, without the aid of chloroform, was then killed, and subsequently I heard that the meat was put on the market.

Just two or three weeks ago I saw a cattle buyer going round the upper country buying for some butcher on the coast. He was told of a cow for sale, but the owner remarked that "she was thin, as she had not got over some sickness yet." "Is she living?" asked the buyer; "well, then, if she can walk, bring her along." My observations in the Orient as well as in the Occident, makes it easy for me to state emphatically that the tuberculous cow is the most common disseminator of tuberculosis in the world, by her flesh as well as her milk, and most veterinary surgeons know this. A healthy cow is a prize and a blessing to its owner; but a

diseased one is a curse; and, gentlemen, you cannot cure a curse, you can only prevent its breeding and spreading and in this way control it. Because every veterinary surgeon knows this, it behooves us to see, if we desire pure food, free of disease, that the most eminent veterinary surgeon in every Province is placed at the head of the Departments of Agriculture. Then we will begin successfully to control tuberculosis, instead of from hospitals, sanitariams and clinics, which can only give their attention to the already afflicted.

The butchers all over this Province, with few exceptions, buy what they like, kill what they like, and sell it to the meat-eating public, without any supervision or control, far less inspection. Some are conscientious, but the majority are not. And, gentlemen, this is the crux of the tuberculosis situation. Rotary may say what she chooses, collect money as if by magic, and build scores of clinics, but until she can give a better use to humanity than mere cure—so excellent and charitable in itself—of human beings, her high purpose will not appeal with the same force and power to those whose minds are capable of a higher reasoning, in favor of the phophylactic, or preventive measures.

To abate this infection in mankind, we must necessarily attack the roots that lie in the source of impure foods that come to our tables wearing a mask of innocence, and liberate the people from the evil clutches of such an insidious foe, which the skill of veterinary surgeons has demonstrated beyond the shadow of a doubt.

Gentlemen Rotarians, will you help us to protect our Canadian people from a system which, however excellent and imperative to preserve our export trade to protect the foreign consumer, militates against the Canadian national health?

Will you help us to impress the powers that be of the necessity of passing a law as speedily as possible that will guarantee to our people a healthy supply of meat, and remove from the face of our civilization forever the scars of tuberculosis?

I know that Rotary will help, because she has already won the respect and admiration of all classes, and she must be jealous that that confidence is never shaken. Long live Rotary.

WILLIAM THOMSON, V. S.

The presence of so many of the older members of the Association at the New Orleans meeting was quite marked, notwithstanding the "dry" times prevailing.

COMMUNICATIONS.

To the Editor:

May I request a little space in the next issue of THE JOURNAL for the following:

"VETERINARY ASSOCIATION OF ALBERTA BAR VISITING BROTHERS.

It would appear that the executives of the Veterinary Association of Alberta have lost sight of the object of an Association meeting and clinic when they excluded from entrance on Nov. 5 a visiting veterinarian holding annual license from the veterinary association of Saskatchewan for the year 1919 and also membership card from the A. V. M. A. as a member in good and regular standing for the year 1919."

Yours very truly,

N. D. CHRISTIE, B. V. Sc.

1109 15th Ave. West, Calgary, Alta., Nov. 6, 1919.

Secretary Mayo, on instructions from the Executive Board of the A. V. M. A., sent a floral tribute to the memory of Mr. Harry C. Moore of Indianapolis, Ind., and the following letter received by the Secretary from Mrs. Moore is self explanatory:

"Dear Doctor Mayo:

I want to express to you, and through you to the American Veterinary Medical Association, my sincere appreciation for your sympathy and for the beautiful floral tribute to the memory of my dear husband.

The knowledge of the high regard and the genuine friendship that so many of your profession had for him is a source of the greatest comfort to me to know.

Most sincerely,

MARY S. MOORE."

THE PROFESSION NEEDS ADVERTISING.

To the Editor:

In your publication for November, 1919, there appeared an article by William N. Berg, entitled "How to Raise the Stand-

ards in Veterinary Education," in which Mr. Berg advocated making the veterinary school requirements exactly parallel with those of medical colleges.

I shall endeavor to point out that Mr. Berg's stand is poorly taken, for he has depreciated the profession unwarrantedly and in the proposed system for improvement has placed least emphasis upon the most essential point: publicity. I will quote a part of the article, which is as follows:

The following quotation is from the Bulletin of Yale University, School of Medicine, 1918-1919, p. 19:

"ADMISSION OF STUDENTS.

"PREPARATION FOR MEDICAL STUDIES.

"Students who enter college with the idea of subsequently studying medicine should realize that the broader the foundation a professional man can obtain the more efficient he will be. Those who are in a position to do so are recommended, therefore, to complete their college course before entering the School of Medicine, including in it the necessary special studies in the sciences.

"In view of the fact that circumstances do not permit all prospective medical students to complete their college course, *two years of college work has been fixed as the minimum general requirement for matriculation in this school.* Work in Schools of Dentistry, Pharmacy and Veterinary Medicine is not accepted as the equivalent of college work."

The last sentence shows how high veterinary colleges stand in the esteem of certain university authorities. Although this sentence was not found in several other medical school catalogs it is plainly implied there. This means that a second year student in Cornell Veterinary Medical College, for example, who changed his mind and decided to study human medicine, would find that he was not eligible to enter the medical schools of Yale and other universities, although he had just finished two years in a good professional school.

I beg to suggest that Mr. Berg has misinterpreted the intention of medical colleges in refusing to accept veterinary education as pre-medical work. It seems that the explanation of their decision is stated in that first line of the bulletin extract above quoted, which informs us that "the broader the foundation a professional man can have, the more efficient he will be."

A broad education is one that includes a knowledge of the arts. This knowledge is essential not only for mental development, but for imparting to its possessor a cultural standing so necessary in any community. To accept other professional studies as pre-medical training would be to develop an ultra-professional or scientific man only capable of doing research and

having no prerequisite training for dealing with the public. This attitude of medical colleges, therefore, does not depreciate the standing of veterinary schools.

Similar requirements, I grant, should be applied to veterinary students and could be if the veterinary profession enjoyed the same popularity as that of the medical profession. Until recent years veterinary medicine was not so essential to the nation's welfare, but as its importance is now being sharply felt and as the demand for veterinarians far exceeds the supply, the most logical way to improve the profession is to first build it up numerically, according, however, to a sufficient standard.

The only way to accomplish this is to advertise.

There is but one reason for all the ambitious young men of our rurals attending agricultural colleges when some should study veterinary medicine; and that reason is the general lack of information about the profession, its attractions and importance. Agriculture is advertised by county agents, and while the veterinary profession does not have such an efficient medium, means could be and should be developed.

A campaign in our cities could produce several good results. I venture to say that one-half their inhabitants are ignorant of the existence of the veterinary medical science, and an enlightenment might accomplish great things. To interest city men would be to first increase the number of veterinarians, and, second, induce city-bred men to seek the rurals, thereby improving the communities both professionally and mentally.

These recommendations may seem to be off the point, but before veterinary medical standards can be raised there must be sufficient veterinarians to supply the needs and at the same time naturally improve the personal professional standards by the laws of survival of the fittest. Until this is accomplished a system of increased entrance requirements for veterinary schools would tend to drive away the few men who are now applying and thus further reduce the present inadequate force. *The profession needs to be advertised.*

RAYMOND WELLS,
Student, Univ. of Penn.

The Southern boys know how to fix up for a real good convention, and they want another A. V. M. A. meeting back South before so very long—so they say.

NECROLOGICAL.

DR. HUGH FRANCIS DORIS.

Dr. H. F. Doris died August 15, in New York City. He was a graduate of the American Veterinary College, class of '85, and afterwards enjoyed a large practice, succeeding his father in Pittsburgh, Pa. He subsequently took up the study of human medicine in West Penn. Medical College, Western Reserve Medical College, and Jefferson Medical College, but failed to graduate. He then studied for the bar in West Virginia University, and while there trained the athletic teams. Finally he located in law practice in New York City.

THE JOURNAL has no record of Dr. Doris being a member of the A. V. M. A.

DR. E. C. ROSS.

Dr. E. C. Ross, New Haven, Conn., died on August 15, at his home in New Haven.

Dr. Ross was a graduate of the American Veterinary College, class '84, and while his name does not now appear on the present list of members of the A. V. M. A., he was an active member until his retirement from active service about 1910.

Dr. Ross was one of the most prominent members of the profession in the State of Connecticut; admired by his brother practitioners, and always ready and willing to give advice to the younger members. He had acquired sufficient to live comfortably after retirement, but for the past year or two was quite feeble, and gradually succumbed to an incurable cancerous condition of the rectum.

Some of the older members who attended the New Haven meeting in 1906 will remember Dr. Ross as being the "guiding star" on that occasion.

DR. R. H. BIRD.

Dr. R. H. Bird, who resided at Greeley, Colorado, and had for many years been a prominent member of the profession of his

state, died at St. Anthony's Hospital in Denver on October 26. The immediate cause of death was a venous hemorrhage at the base of the brain resulting from an injury to the jaw received while vaccinating cattle.

Dr. Bird was the son of James and Helen Amy Hewitt Bird of Kirkliston, Linlithgow, Scotland, where he was born on May 17, 1854. He was a member of the British Royal College of Veterinary Surgeons, and graduated from the Royal (Dick) Veterinary College, Edinburgh, April 17, 1873. Subsequently Dr. Bird served as a veterinary inspector in Ireland from 1878 to 1883. He later went to Australia, from where he came to the United States, and served as State Veterinarian of Montana from 1895 to 1897. Soon afterwards he moved to Greeley, where he has since resided.

Dr. Bird became a member of the U. S. Veterinary Medical Association in 1895, and has since held membership in that organization and its successor, the American Veterinary Medical Association.

The Doctor was a prominent member of the Colorado Veterinary Medical Association, having served as its president for two successive years. He was treasurer of the Colorado Board of Veterinary Examiners at the time of his death.

His lodge affiliations were numerous, he having been associated with the Knights of Pythias, Elks and Masons. In his death the profession of Colorado, as well as the A. V. M. A., loses one of its ablest members.

DR. WATT ASHCRAFT.

Dr. Watt Ashcraft, of Monroe, N. C., died recently at his home as the result of a punctured wound of his foot setting up blood poison. We understand that the Doctor had been suffering from diabetes for several years, which no doubt had the effect of weakening his constitution and hurrying on the final issue.

Dr. Ashcraft was born at Rock Rest, N. C., July 22, 1887, and graduated from the Chicago Veterinary College in 1908. He was married in 1912 to Miss Viola Willson, of Baltimore, and is survived by his widow, mother, four brothers and a sister.

He was a member of the North Carolina State Veterinary Medical Association, and took a very active part in its delibera-

tions. He was also a member of the North Carolina State Board of Veterinary Examiners for several years; and he was a member of the A. V. M. A.

His fellow practitioners in North Carolina regarded Dr. Ashcraft as the leading veterinarian in the state.

In a beautiful tribute to his memory, by Rev. J. E. Abernethy, of Salisbury, N. C., there appears the following:

"In a classic sense Dr. Ashcraft was not a scholar, but he had learned well the divine art of thinking. His mind moved with the accuracy of a full-jeweled watch. He was a master of his profession. If the dumb animals of Union County were given the power of intelligent speech, they would rise up in a body and call him blessed.

"He was preëminently a gentleman. He proudly wore the integrity of a plumed knight, and looked with disdain upon every form of fraud. He walked the royal highway of honor, and kept the company of his self-respect. He had the elements of a real man. He admired truth, and despised falsehood. He loved honesty and hated hypocrisy. He lived a clean life, and frowned upon every wretch who blights the flower of virtue."

MRS. HAMLET MOORE.

Mrs. Hamlet Moore, wife of Dr. Hamlet Moore, New Orleans, La., died September 28, 1919. Mrs. Moore before her marriage was Miss Haydee Sitgef. She was 44 years of age and the mother of four children, two boys and two girls ranging in ages from 16 to 20 years respectively.

Dr. Moore and the surviving children have the sympathy of THE JOURNAL, but it is far more consoling to know that the mother had fulfilled all her obligations on earth and leaves a loving memory.

The "sanitary kiss" recommended by Dr. Fred. J. Mayer at the banquet of the A. V. M. A., did not quite appeal to all of the ladies present, especially the younger set.

The visiting ladies seemed to have a great time seeing the sights of New Orleans, some of whom took advantage of the famous French Opera.

MISCELLANEOUS.

HORSE AND HUMAN INFLUENZA.

Writing in the *New York Medical Journal* Major George A. Soper, Sanitary Corps, U. S. A., presents a paper on "Influenza in Horses and Men," which, containing facts from army investigations, is published with the permission of the surgeon general. "Economically," writes Dr. Soper, "influenza is the most important disease of horses in temperate climates." Boston realizes this in peculiar fashion, since its great fire gained headway at a time when horses were incapacitated by the epizoötic. The mortality among remounts in the recent army due to influenza has been many times more than to all other causes together. It is estimated that more than 25,000 horses purchased in Canada and the United States for the British Army during the years of the war died on this side of the ocean while awaiting shipment. In the Army of the United States the loss among the horses amounted to $100,000 a week.

Epizoötics have occurred from the earliest historic times. Italy had an important one in 1301; in 1711 it followed the tracks of great armies over Europe and in 1870-73 it was a pandemic occurring with the Franco-Prussian war. Its spread over this country was a wave. It appeared in Toronto in September, reached Buffalo and Detroit in the first two weeks of October, by the third week it had spread to Bangor, Albany and New York and then quickly invaded a wider district. It reached Milwaukee the first week in November, and about the same time was observed in Raleigh and Charleston and by the end of the month had touched Houston, Texas, and Little Rock. In December it reached Colorado, in January it was in New Mexico and Utah, by March and April it invaded the West Coast and Mexico and by summer time it was in Guatemala. It affected more than a million equines.

Mortality rates of horses last year at the army shipping ports ran as high as 150 per thousand per year, which figure makes it comparable with losses from human maladies.

Dr. Soper draws an analogy between the human and the equine influenza, and suggests that close study of horses' influ-

enza may help in the human disease. He notes that it spreads at about the rate of the transportation of horses and points out the fact that humans travel very much more quickly. It is not so surprising, therefore, that the recent pandemic ran over the country with such speed.

MR. HARRY C. MOORE.

(A SHORT BIOGRAPHY.)

Mr. Harry C. Moore, of Indianapolis, notice of whose untimely death appeared in the November JOURNAL, was born in Delaware County, Indiana, in 1874, and grew to manhood there. His parents, John L. and Lorinda (Lewis) Moore were natives of the same county, and their respective parents were among the pioneers who reclaimed Indiana from the wilderness and its original savage owners.

In his early manhood, Mr. Moore was associated with his father in the wholesale grocery business in Indianapolis, and later became purchasing agent for the White Knob Copper Company, Mackay, Idaho. In 1905, he became treasurer for the Pitman-Myers Company at Indianapolis, which at that time operated a small pharmaceutical laboratory, manufacturing a limited line of physicians' supplies. The growth of the company, after Mr. Moore became associated with it, was rapid, and in 1906 a new pharmaceutical laboratory building was erected in the heart of the business section of Indianapolis. In 1913 Mr. Moore became president of the company, and it was reorganized under the name of Pitman-Moore Company; and in the same year the Veterinary Biological Laboratories of the company were established.

It happened that Mr. Moore's death occurred in Indianapolis at the time of the Conference on Tuberculosis Eradication was being held in Chicago, and the following resolutions, concerning his death, were adopted by the conference:

"Whereas, Death has taken from us one of our valued friends and one who always had the live stock interests of the nation at heart; and

Whereas, In the death of Mr. Harry C. Moore, of Indianapolis, Indiana, the federal and state officials, as well as the entire veterinary profession, have lost a valuable and energetic co-worker; therefore, be it

Resolved, That we deeply mourn his loss, and that the memory of his friendship shall ever be a bright spot in our lives; and be it further

Resolved, That a copy of these resolutions be sent to his family with our love and sympathy."

SCHOOLED VETS GET GOOD POSITIONS.

The army emphasizes the fact that it offers a useful training to its enlisted men which will be of value after their return to civil life. This is aptly illustrated in the activites of the Medical Department.

One of the most important functions of the Veterinary Corps is its meat and dairy inspection service. This Corps is responsible for the inspection of all meats and meat and dairy products purchased for the army. To maintain this important work, the Corps established officers and men at the packing house center in Chicago.

All men selected for this duty in the Veterinary Corps are first given a thorough course of instruction, consisting of lectures, demonstrations and practical work, under officer specialists, to qualify them as assistants to the veterinary meat and dairy inspection officers.

Their services as trained assistants are needed not only at the packing centers, where large contracts for these products are made, but also at all army posts. This inspection is maintained at all points of purchase, trans-shipment points, and places of issue.

The Surgeon General has lately received letters from three of the leading meat packing companies stating that they are now employing discharged army men who were trained in this work by the Veterinary Corps, and that in every case their services are found to be very satisfactory. Their salaries in one company average $35 weekly, while in the other two a salary of $40 weekly is paid.—*The Come Back.*

DR. WINCHESTER'S EFFORTS APPRECIATED BY HIS PEOPLE.

Bulletin 72 of the U. S. Department of Agriculture, which calls attention to the menace which tubercular cattle are to the public health, has called forth the following from *The Leader* (Lawrence, Mass.) concerning the splendid work of Dr. Winchester in that connection:

"For thirty-two years Dr. John F. Winchester of this city has been carrying on his campaign of education on this very question. If I am not mistaken, it was Dr. Winchester who first presented this matter in a Massachusetts state report, and he has continued the battle against the tubercular cow ever since, contending against official indifference and public apathy on the one hand, and commercial and agricultural greed on the other. His fight might have been well compared to the tilting of Sancho Panza against the windmill, so far as immediate results were concerned; but he has succeeded in establishing the truth that he has been standing for, as this official publication of the U. S. government shows.

"It is a result that repays Dr. Winchester for his ceaseless stand for the lives and health of the little children of the nation."

THE JOURNAL congratulates Dr. Winchester, and delights in such splendid appreciation being afforded one of the staunch members of the veterinary profession.

APPOINTMENT FOR DR. WINCHESTER.

Dr. John F. Winchester has been notified of his election to the committee on meat inspection of the American Public Health Association.

The letter of notification follows:

Boston, Mass., Nov. 5, 1919.

Dr. John F. Winchester,
Lawrence, Mass.

Dear Dr. Winchester:

I am taking this means of notifying you of your election as a member of the committee on meat inspection, of the section on food and drugs, of the American Public Health Association, at the recent meeting of the Section, held in New Orleans. Mr. Geoge H. Shaw, Chief, Division of Housing and Sanitation, Room 615, City Hall, Philadelphia, Pa., is chairman of this committee.

Sincerely yours,
JAMES O. JORDAN, Executive Secretary.

We feel sure that the veterinary profession of this country will appreciate the appointment of Dr. Winchester as a decided compliment, not only to himself, but to the profession generally.

Dr. Winchester's aim in this sort of work has always been the prevention and alleviation of human suffering and distress, in their association with the lower animals, through suggestion and sound advice as to the most reasonable and feasible methods.

To be elected on such an important committee of the American Public Health Association is a high honor, and THE JOURNAL heartily congratulates Dr. Winchester, who is so eminently worthy of it.

NOTICE BY THE UNIVERSITY OF WISCONSIN.

To meet the calls for a veterinary training from Wisconsin's returning soldiers, the State Board of Education has asked the university authorities to establish the first two years of a course in veterinary medicine.

Replies to the questionnaires, recently sent out by Governor Philipp to determine how many of the state's soldiers and sailors would avail themselves of the $30 a month bonus, indicated that a considerable number wish to study veterinary medicine. No institution in the state has been training men to enter the veterinary profession.

Upon the recommendation of the State Board of Education the university will give the first two years of a four year professional course in veterinary medicine. Although designed primarily for bonus students, the course will be open to any who can satisfy the entrance requirements of the university. Officials of the institution are planning that students who complete the two years' work will be qualified for advanced standing in any of the veterinary colleges of the country. Besides work in the department of veterinary science, the course will include instruction in the departments of bacteriology, chemistry, animal husbandry, physics, physiology, pharmacy, and zoölogy.

Stockmen in many sections of the state have frequently championed the proposal to establish a veterinary course. They argue that improved stock raising is growing so rapidly in Wisconsin that a strong staffed and well equipped course in which to train veterinarians would be a profitable investment for the state.

Among the missed members at New Orleans were Drs. Rutherford and Torrance, of Canada, both former presidents of the A. V. M. A. Their absence was unavoidable, however.

The Ladies' Auxiliary of the A. V. M. A. was well represented at the recent meeting. Their membership seems to be increasing both in numbers and in interest.

Dr. M. H. Reynolds, of Minnesota, rarely misses an annual meeting, and was at New Orleans displaying his usual interest in Association matters.

Northern members attending the meeting appeared to enjoy the celebrated Louisiana pecans, as a number of orders were left for consignments.

The Army Veterinary Service illustrations were a great asset to the program of the meeting.

The time to begin to get ready for the 1920 meeting at Columbus is right now.

The "men in khaki" added a military air to the annual meeting.